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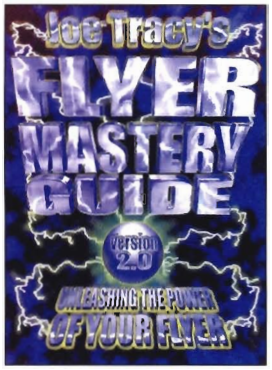

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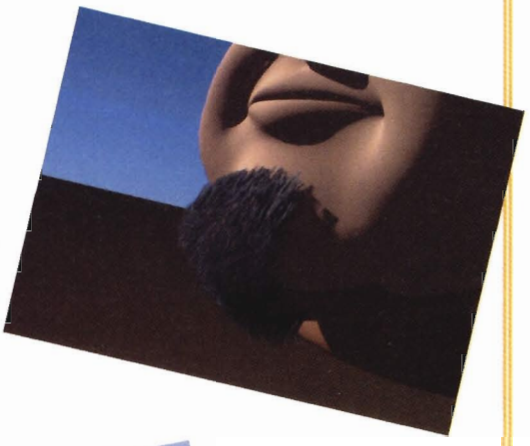

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ON THE COVER:

This issue's cover is a caricature of NewTek visionary Tim Jennison, created by epic software group's Tom Jordan and William Vaughan. The hair on Jennison's face and head can be created simply in LightWave 3D as explored in the "Hair Raising Tutorial" on page 15.

TekTALK

OUR EDITOR'S OPINIONS ON IMPORTANT NEWTEK ISSUES

BY JOE TRACY

Take the NewTek NAB True and False test. NAB holds the answers.

NewTek's NAB Revelations: THE RUMOR QUIZ

The rumor mills have been turning for weeks with what NewTek would reveal at NAB '99. Surrounded by a cloud of mystery, LightWave 3D 6.0 rumors were especially running wild. To add to the hysteria, *NewTekniques* did some digging and was able to come up with a True or False quiz for you to take that will ultimately separate the rumors from the realities. So get out your pencil and circle your answers. Then, after NAB go to the *NewTekniques* Bonus area (www.newtekniques.com/bonus) for the answers.

True or False: NewTek has been hard at work for the last four years on a revolutionary new Video Toaster system for Windows NT, which will provide a complete non-linear editing solution for PC video producers, including editing in an uncompressed format.

True or False: For the last two years, NewTek has been working on making a hover board, as seen in the *Back to the Future II*, a reality. This has been a side project by a couple of the main engineers, including Tim Jenison, who plan on showing a prototype of this hover board at either NAB or SIGGRAPH.

True or False: NewTek will ship a PC non-linear editing solution for video producers within three months of NAB.

True or False: Speed Razor plays a part in NewTek's next-generation editing system.

True or False: A PC non-linear editing package containing an entry level version of LightWave 3D, the hardware card, timeline editor, Aura, D1 uncompressed editing, can cost less than $4,000.

True or False: Tim Jenison's dad invented television.

True or False: NewTek has a unique way of creating PC effects that will blow away any other video effects on the market.

True or False: In a *Star Wars: Episode 1* background scene (Senate counsel), you will see an Amiga 4000T computer with the Flyer's switcher interface on screen.

True or False: Next fall, NewTek will release a cool new storyboard PC interface switcher that can be best described as the "Flyer on Steroids." It will have 24-bit croutons, nested projects, navigation tools, and a cleaner architecture

True or False: The new PC Toaster will have a video input/output board that will allow PC videomakers to have 16 inputs and 8 outputs that can be intermixed.

True or False: LightWave 6.0 will have a non-linear editing environment, a new IK/FK animation system, a new motion editor, rewritten modeling tools, interactive modeling tools with subdivision surfaces, and 90% more new features.

NewTekniques

VOLUME 3 • NUMBER 2 • Published by ADVANSTAR Communications
www.newtekniques.com

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Plugged In

LIGHTWAVE ADVANCEMENTS THROUGH PLUG-IN SCRIPT WRITING

BY BOB HOOD

Explosive LScript Programming

SIMULATING EXPLOSIONS

Using LScript features and simple math can create an explosive effect.

I'm not an animator, but I enjoy animation because I consider all forms to be art, a manifestation of the human imagination. In particular, I have a fondness for computer-generated animation because I think it's a hoot to see something realistically controvert the known laws of nature. On the other hand, replicating the laws of nature in a software-driven environment is also one of my favorite activities. To some software developers, the challenges of simulating the forces of nature can be as much fun as watching the results.

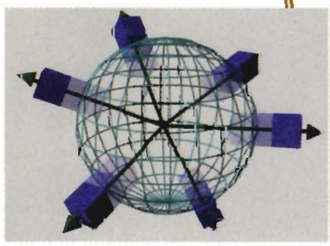

Figure 1: Trajectories of objects effected by KaBob

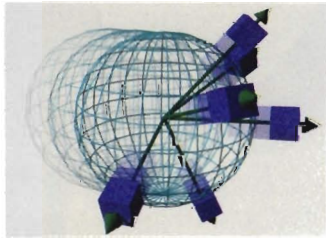

Figure 2: Uniform motion behavior of non-delayed objects

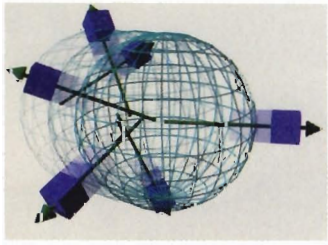

Figure 3: Pressure variance introduced by random delays

In this first of two parts, we'll employ some familiar features of LScript, along with some simple math (the language of nature!), to produce an effect that simulates the forces of an explosion. This simulation is whimsically known as "KaBob."

Doing Things The Wrong Way

We will produce KaBob using an effector mechanism similar to the one we created last time (to produce the transparency effect). This time, however, all we will be interested in are the motions of objects, so the system can be implemented using two LS/IA scripts: one for the effector, and one for use by each of the effectees.

One of the most enigmatic behaviors of the Item Motion plug-in architecture is that Layout may invoke your plug-in in a non-linear fashion with respect to time—a behavior that often presents problems for new plug-in developers, sometimes even catching seasoned developers by surprise. This lack of time-based linearity (most evident when the "Show Motion Paths" setting of Layout is active) often requires a plug-in to be able to report the position, rotation and/or scaling of an object at any point in time. Such foresight is often the result of calculations involving the provided frame and/or time index, or the plug-in might simply pre-calculate all of these values when it starts.

When Item Motion plug-ins exchange data directly, however, you can run into problems with timing. If an Item Motion plug-in sends its calculated data to another plug-in, it is possible that the data was produced for, or influenced by, a time index different from that of the receiver! The solution to this is that calculated data is often buffered in an array (typically in some form of shared memory) whose each element corresponds to a frame (or time index) of the current scene. The receiver then simply uses the frame/time index provided to it to locate the correct data.

The nature of LScript's built-in Queue mechanism (introduced in

the last installment) does not allow for such complex structures to be exchanged between scripts, however. Because it does not provide for the data depth needed, this limitation in the built-in Queue system requires the receiver to assume that the data was calculated for the same time/frame index within which the receiver has been called. Therefore, we must design our scripts to process as though Layout is invoking each plug-in for the same frame/time index. In those instances when this assumption fails, some odd behaviors will manifest. This is simply unavoidable in the current design.

A Little Rocket Science

Figure 1 illustrates the idea of KaBob. The large sphere in the figure represents the effector object. The center of the effector object represents one end of the vector that will be used to calculate the trajectory of each object. However, in order to have a complete vector (direction and magnitude), you must have two points, so we use the center point of each object to determine the trajectory vector. These trajectory vectors are illustrated in Figure 1 by the arrows that emanate from the center point of the effector.

Along with a trajectory vector, we need to have a velocity for each object. Velocity is essentially the speed of an object, defined as the amount of time it takes an object to travel between two points measured along its trajectory. In KaBob, we will use both a constant trajectory and a constant velocity on a per-object basis; gravitational and atmospheric effects are currently beyond the scope of this project. Application of these natural forces is left as an exercise for the reader!

To make things a bit more interesting, we will calculate each object's velocity based on its distance from the center point of the effector when it comes into the effector's influence. The closer an object is to the center point of the effector when this event takes place, the greater its velocity will be as it is flung away from the effector.

Turning A Blind Eye

When an object falls within the effector's range, it is immediately subject to the effector's influence. In some situations, this behaviour can produce a uniform movement to the effected objects. Figure 2 illustrates this tendency. As the effector passes through a collection of objects, they each become influenced the moment they interact with effector's outer surface.

In order to "break up" this uniformity (the pressures within an explosive force are not uniformly distributed) we allow each object to calculate a random delay that begins as soon as the object comes within the effector's influence. Until this delay expires, the object is not bothered by the effector. These individual delays can be visualized as sub-zones within the effector itself, each belonging only to a particular object. The nearness-based velocity calculation is still in full force for these sub-zones, however. Objects whose sub-zones are smaller (nearer to the effector's center) will have higher velocities than those objects whose sub-zones are larger.

Figure 3 illustrates the modified behavior of individual effected objects when the delay factor is enabled. As the effector passes through a collection of objects, they each fall within the influence of the effector at different times.

Attention To Detail

Listing 1 is our KaBob effector LS/IA script.

Line 4 declares a "macro" known as NAME that will evaluate the name of our script. This macro is used in several different locations

Listing 1: The KaBob Effector LScript

```
001: warnings
002: version 1.4
003:
004: define NAME  "KaBob - Effector"
005:
006: expose position,
007:    effectrange,
008:    active,
009:    useDelay,
010:    minDelay,
011:    maxDelay,
012:    maxStep,
013:    rotationrange
014:    as KaBob;
015:
016: scaleEffect;
017: effectRadius;
018:
019: create
020: {
021:    setdesc(NAME);
022:
023:    effectRadius = 5;
024:    scaleEffect = false;
025:
026:    active= true;
027:    useDelay=false;
028:    minDelay= 0;
029:    maxDelay= 5;
030:    maxStep=.5;
031:    rotationrange=10.0;
032:    effectrange=effectRadius;
033: }
034:
035: process: ma, frame, time
036: {
037:    position=ma.get(WPOSITION,time);
038:
039:    scale=1,1,1;
040:
041:    if(scaleEffect)
042:       scale= ma.get(SCALING,time);
043:
044:    effectrange=effectRadius * scale.x;
045: }
046:
047: options
048: {
049:    if(!reqbegin(NAME))
050:    {
051:       error("Requester cannot be created without
Panel Services");
052:       return;
053:    }
054:
055:    c1 = ctldistance("Effect Range
(meters)",effectRadius);
056:    c2 = ctldistance("Maximum step per
frame",maxStep);
057:    c3 = ctlnumber("Rotation Range (degrees)",
rotationrange);
058:    ctlsep();
059:    c4 = ctlcheckbox("Enable influence
delay?",useDelay);
060:    c5 = ctlinteger("Minimum effect delay
(frames)",minDelay);
061:    c6 = ctlinteger("Maximum effect delay
(frames)",maxDelay);
062:    ctlsep();
063:    c7 = ctlcheckbox("Effector active?",active);
064:    c8 = ctlcheckbox("Tie effect range to object
scale?",scaleEffect);
065:
066:    if(reqpost())
067:    {
068:       effectRadius= getvalue(c1);
069:       maxStep= getvalue(c2);
070:       rotationrange=abs(getvalue(c3));
071:
072:       useDelay=getvalue(c4);
073:       minDelay=getvalue(c5);
074:       maxDelay=getvalue(c6);
075:
076:       active = getvalue(c7);
077:       scaleEffect= getvalue(c8);
078:    }
079:
080:    reqend();
081: }
082:
083: save: what, io
084: {
085:    if(what  SCENEMODE)
086:    {
087:       io.writeln(effectRadius);
088:       io.writeln(rotationrange);
089:       io.writeln(useDelay);
090:       io.writeln(minDelay);
091:       io.writeln(maxDelay);
092:       io.writeln(maxStep);
093:       io.writeln(active);
094:       io.writeln(scaleEffect);
095:    }
096: }
097:
098: load: what,io
099: {
100:    if(what=SCENEMODE)
101:    {
102:       effectRadius=number(io.read());
103:       rotationrange=abs(number(io.read()));
104:       useDelay=integer(io.read());
105:       minDelay=integer(io.read());
106:       maxDelay=integer(io.read());
107:       maxStep=number(io.read());
108:
109:       active=(integer(io.read())! 0);
110:       scaleEffect=(integer(io.read())! 0);
111:    }
112: }
```

within the script. However, because of the nature of macros, if we ever need to change it, we need only do so in one location.

Lines 6-14 create our Queue effector variables. These Queue variables, collectively belonging to the KaBob queue, will be used to transmit our working and calculated values to other scripts. Recall from the discussion in the last installment that such variables are treated simply as global variables within the script that created the Queue. No special qualifiers are needed to let LScript know that these are queue variables.

Lines 16-17 declare some variables that are global only to our effector script.

Our create() function (lines 19-33) sets the name of the script (using the aforementioned macro NAME), sets the initial values of our global variables, and initializes the values of the variables in the KaBob queue.

Line 23 sets the effector's influence range to 50 centimeters (one half meter). Looking ahead at line 32 you might wonder why we are setting a Queue variable using only another variable. As was the case with our transparency effector, we will give the KaBob effector the ability to scale its range of influence based on the scale setting of the effector host object. The effectRadius variable on line 23 holds the actual range, while the queue variable effectrange will hold (transmit) the resulting range of influence after any scaling calculations have been made.

The ability to scale the effector's range opens some interesting possibilities in KaBob, allowing the scale of the effector to be enveloped in Layout. Scaling the effector upward between two frames can suddenly place objects within the effector's influence, better simulating the expansive forces of an explosion.

The maxStep setting on line 30 specifies the maximum velocity that any object can have. In this case, we initialize this value to be 50 centimeters (one half meter) per frame. Each object will calculate its own velocity based upon its distance from the effector's center point. This value represents the upper range of that calculation.

In order to add some realism, we allow each object to calculate a rotational value that will be applied as the object hurls away from the effector. The rotationrange setting on line 31 holds the maximum amount of rotation (measured in degrees) that each object can have. Each effected object will generate a random rotational value that is within this (plus or minus) range.

Lines 35-45 hold the process() function. We transmit our frame-by-frame operational values to the effected objects in this function. The only real work we must perform in this function, however, is calculating the effector's range. If scaling has been enabled, we must read the effector's current scale setting, and multiply that by the effector's established

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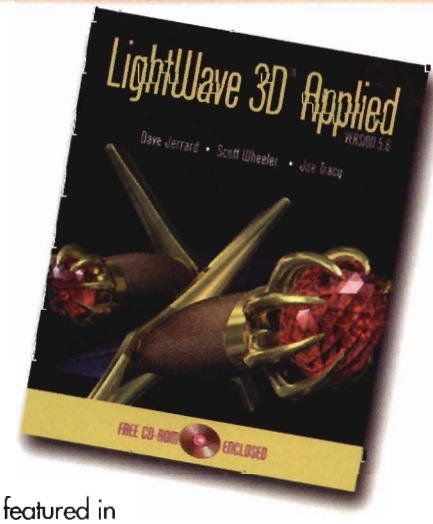

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range of influence. This result gets transmitted to the effected objects on line 44.

You might notice (on line 44) that we only multiply the effector's range by the scaling factor along the X-axis. Because our effect radius is spherical, it really doesn't matter which axis we use. They are all assumed to be equal.

Lines 47-96 contain our options() function. The activities taking place in this function should be familiar by now, and should not need detailed explanation.

Plastic Memory

New to our Layout scripting are the save() and load() functions. These functions are known callbacks for LScript (like process() and create()), and are used when scene or object files are saved to disk or loaded into Layout, respectively. It is within these functions that scripts can store and recall their instance-specific working data. In contrast to LScript's built-in store() and recall() functions, the data managed by save() and load() are specific to the object to which they belong (whereas, store() and recall() manage data global to the class of a script).

Both functions take the same parameters. The first designates the type of the data source (in the case of load()) or destination (in the case of save()). This parameter can be either SCENEMODE to indicate that data is being stored to a LightWave scene file, or it can be OBJECTMODE if the external data source is a LightWave object file. Each mode requires a different set of methods to be used; SCENEMODE requires ASCII-mode I/O methods, and OBJECTMODE requires binary-mode I/O methods. As of the time of this writing, the only Layout plug-in architecture that deals in OBJECTMODE data I/O is Procedural Texture (LS/PT).

The second parameter is a Layout I/O Object Agent. This Layout I/O Object Agent is similar to the LScript File Object Agent, but only contains a subset of its methods. For instance, things like checking the line count of a file, or rewinding it, are not permitted because the file with which you are interfacing does not "belong" to you (i.e., you didn't open it).

In the case of SCENEMODE, all data stored in the scene file must be stored as character strings (note the use of the writeln() method in the save() function). The data is converted back into its appropriate type as it is read back into the script. Note this conversion taking place in the load() function through the use of the built-in integer() and number() functions.

Halving A Blast!

That's the first half of our project. Next time, we'll conclude with an examination of the "effectee" script, and discuss some applications of KaBob.

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ALIEN BLOODY FINGER STUMPS
THE FACULTY

BY
GREG NELSON

This is an article I've wanted to do for some time. However, when you're writing about a studio feature, sometimes it takes a while to get everything cleared.

A scene from The Faculty.

I spent a major portion of the autumn of 1998 working on *The Faculty*, directed by Robert Rodriguez. Unfortunately, the film didn't do as well as all of us working on it would have liked, but it is coming out on video soon, and there are some shots in it that I'm quite proud of.

When I was first asked to work on it, I was shown the "all known effects reel." That first viewing sticks with me, because as my mind was racing with the words, "There's no way I can do that...There's no way I can do that," they asked me, "You can do that, right?" And in classic "freelancer who needs a job" form, my mouth completely disregarded my mind and responded with, "Suuuure, absolutely, no problem. Yeah, I can do that."

In all honesty, the shots we did for *The Faculty* are some of the most difficult and rewarding I've ever been involved in.

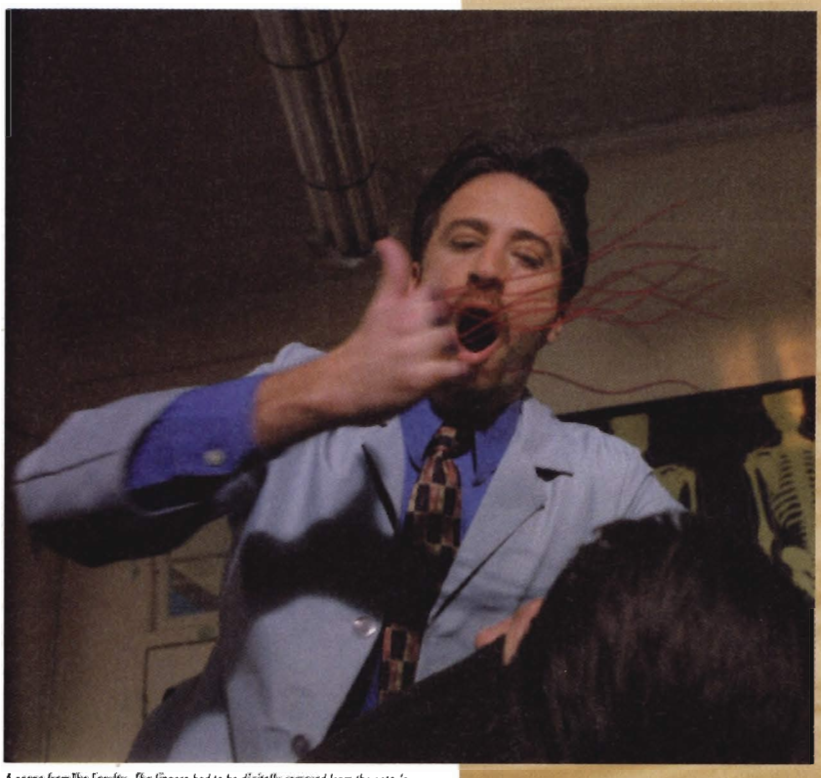
There are two in particular that I want to talk about. The first involves a finger removal and replacement on actor Jon Stewart's moving hand. The scene takes place in a classroom where Stewart is fighting with one of the other actors and gets the four fingers on his left hand cleaved off by the blade of a paper cutter.

Now, since his character has been infected by aliens, he has a creature with thin wispy tentacles living under his skin. Once his fingers came off, all that remained was the thin tentacles floating in air as if they were suspended in water. What is particularly challenging about this shot is the movement of the hand, the shift in perspective, and the movement of the camera.

Now, I'm not going to just come out and say, "well we clicked on the icon with that funny little squiggle and LightWave solved all our problems." It didn't. Ultimately, it was a major part of the solution that involved motion tracking in Digital Fusion, significant paint work in Photoshop and several layers of compositing, also done in Fusion.

Our first task was to remove Jon Stewart's fingers, which were painted green so we could isolate them and replace them with bloody stumps. In order to remove the green fingers. Jim Carbonetti drew the short straw and spent nearly two weeks doing nothing but painting them out of every frame in every shot in which the fingers appeared.

While Jim was painting, Scott Coulter was building the hand element and getting the bloody stumps to track with the actor's hand. This was quite a challenge, because the hand banks vary



A scene from The Faculty. *The fingers had to be digitally removed from the actor's hand and replaced with bloody stumps and alien tentacles.*

sharply at the beginning of the shot while it moves right to left across the screen then changes heading abruptly at the end.

I won't bore you with the myriad of ways we tried to track this thing, I'll just cut right to the answer. We figured out our key timings, so we knew exactly when it needed to bank and change heading. Then we applied our timings to the bloody stump finger object sitting in Layout.

Now since the actual tracking was done in Fusion, you would think we could set the object right in the center of the camera, rotate it in LightWave and track it on in Fusion. Well, in theory, that is the answer. However, the thin, wispy tentacles that happen to be parented to the bloody finger object need to look as if they are floating in water while reacting to the movement of the actor's hand. The way we chose to get that look was via Lazy Points. The only catch to Lazy Points is, they don't react unless the object is actually moving. But, if the object is moving around in front of the camera in Layout, you can't apply it to a tracker in Digital Fusion, otherwise it'll jump all over the screen.

So, to solve this issue, we parented the LightWave camera to the bloody finger object. Parenting the camera allowed our objects to actually move through 3D space but since the camera is moving with them, the objects remain centered in front of the camera and the tentacles are floating like nice thin wisps through the air. Then all we had to do was take the rendered images, apply them to the tracker in Fusion and the shot worked.

The second shot is one that gave me the nightmare that always ends with me showing up at the premiere and when we get to my shot, its nothing but a big red X and the words "temp FX here" keyed over it. I mutter something like, "oops, I knew I missed something," crawl over into the corner of the theater and die.

To set it up, this is a slow motion, 120 Frames per second, hand held shot of an actress running away from the edge of a swimming pool as an air cannon under the water's surface creates an explosion of water that blasts liquid straight up, all over the actress and ultimately on to the camera's lens. Now, that is just the background plate. What they wanted was for me to put in tentacles that exploded up in the water, behind the actress.

To be fair, this shot was never intended to be a CGI shot. We were asked after the fact to enhance a practical effect that didn't quite fill the screen exactly the way they wanted.

Since the actress was not shot on blue screen, the first task was to rotoscope and cut a matte in Digital Fusion, thus removing the girl from the background plate. Ultimately this was successful, but was quite a challenge due to the movement of the camera and actress and the water splashing on the lens.

With mattes pulled for her, now it is quite simple to put the CGI tentacles behind her. Since the camera is moving left to right, I found a tracking point on a wall somewhere, which allowed me to lock the tentacles in place.

At this point the tentacles are completely integrated into the shot, with the exception of actually being in the water. To do this, I pulled a luminance key of the water in Digital Fusion, then I applied that key back on to the alpha channel of the tentacles. By applying the key on to the alpha channel, it distorts the transparency of the tentacle element just enough to trick the eye.

At this point, my shot was at about 90%, I still needed to deal with the water splashing on the lens. Again, this is a Fusion trick. You'd be surprised how much a well-timed traveling matte of gaussian blur looks like water hitting a camera lens. That little effect completely sold the shot, and to my surprise, my nightmare shot was finaled on version one.

I know it is difficult to visualize exactly what I'm talking about unless you've got it in front of you, so I encourage you to spend a couple of bucks and rent *The Faculty*. It is actually quite a fun, classic monster movie that has some very cool effects in it.

Greg Nelson is currently working on Dogma, *the new film by Kevin Smith. You can reach him at Kidneyboy@MSN.com*

AN EPIC IN THE MAKING

BY
DICK DE JONG AND
MOLLY DINKINS

"I am a product of the oil patch," said Vic Cherubini. And with a wildcatter's sense of where the next big strike is, Cherubini has led his company, epic software group, inc., into the brave world of new media.

The cast of Inspire 3D characters that appear in epic's "Holiday Squares" CD-ROM.

Making technical information (like drill bits) fun and interactive is one of epic's specialties

Staying ahead of the constant cyclonic changes in the industry can be as difficult as capping a gusher; but during the last nine years, Cherubini has navigated nimbly through the twists and turns of the emerging technology. In fact, the history of his company, based in The Woodlands just north of Houston, reflects how quickly the multimedia business has evolved.

With a background of 10 years in sales and marketing in the Texas oil and gas industry, Cherubini decided to strike out on his own. He had been developing the concept of the epic software group while working on his MBA at the University of Houston, and in 1990, he founded the company. Epic is an acronym for Electronically Produced Interactive Catalogs. "We took a company's printed catalog and made it interactive and intelligent," Cherubini explained. "The program works like a salesman, guiding the client through a series of questions that helps him understand which products are best for him."

In the early days, the delivery medium for the catalogs was diskettes. CDs weren't used until around 1994 or '95, when CD players came packaged with computers. Even then, convincing companies to switch from traditional catalogs was a tough sell. "Trying to demonstrate multimedia when CD-ROMs came in two flavors, single speed or double speed, was like the digital version of Chinese water torture," Cherubini said.

"It was the explosion in the popularity of the Internet that seemed to turn the tide because 'new media' now became a line item on most corporate advertising budgets," Cherubini added. "And the hundreds of sales calls I made to the large oil and gas companies around

town started to pay dividends."

Into the Third Dimension

The epic software group puts Inspire 3D through many channels, including the creation of children books like the one below from the "Happy and Max" series.

"All the planets seemed to align in 1995," Cherubini said. Not only did business pick up, but also artist William Vaughan entered the epic galaxy. Vaughan was a graduate of the Visual Communications program at the Art Institute of Houston and had worked as an illustrator for ad agencies. "When I came to epic, they weren't doing 3D animations. They were heavily into programming and not really a graphics shop," Vaughan said.

While Vaughan had no previous 3D CG experience, he was intrigued by it when he was working at an ad agency. "We bid a job with the Will Vinton Studios. I had been sculpting a lot of characters in clay; but when I saw what they were doing with computers in 3D, it was obvious to me that I should move into 3D," Vaughan added.

At Left: an image from "Lazy Hot Days Under Lollipop Trees."

"When William came to epic, we started him with a copy of 3D Studio MAX. He spent a month working with it and he didn't have much to show for it," Cherubini said. "I was pretty upset. Then he mentioned that he had heard about LightWave. We found a cracked version and in three days, he showed me more than he had in that month with 3D Studio MAX." So they went out and bought a copy of LightWave.

"After that, every client that came through the door, we tried to convince that 3D was the solution," Cherubini continued. "Within a week, we found a client and William spent three weeks straight learning LightWave." It's this kind of persistence, drive, and determination that has spurred the epic software group to become leaders in their field. (It also brought them to NewTek's doorstep. See the "10% Inspiration, 90% Perspiration" section of "The Acid Test" sidebar to the right.)

"What sets us apart is that we give our clients exciting and entertaining graphics. The electronic catalogs that we produce include a great deal of useful technical information coupled with the eye-candy that keeps a prospect's attention during a sales presentation," Cherubini said.

When their skill in programming with Macromedia Director is added to the recipe, epic can mix the most prosaic ingredients and whip up a dessert. "In the Hughes Christiansen electronic catalog, we were able to take something as boring as drill bits and make it almost like a game," Vaughan said.

Perhaps the Cap Gemini greeting cards are the best examples of epic's convergence of 3D art and interactivity with business and marketing. "Cap Gemini is a large computer consulting firm (33,000 employees worldwide, 4,000 in the US), and in 1997, the North American Division wanted a special way to wish its customers and employees a happy holiday," Cherubini said. "They were planning to take out a full-page ad in *Forbes Magazine*. Instead, they came to us with an idea for an interactive greeting card on CD-ROM that would include animation, video and high-res-

THE ACID TEST

"We have a strange hiring process," said Vic Cherubini, epic software group's founder and president, explaining the company's success at corralling champion talent. "We look at an applicant's portfolio and give him a project to do—such as to model 10 objects in LightWave. We tell him to come back in two weeks. We call it our acid test."

"Most applicants see it as a chance to show off," added William Vaughan, epic's art director. "We found that some people don't understand the concept of a deadline. And the acid test is all about starting and finishing something."

"If we like what we see, we give them a 90-day trial," Cherubini continued. "We then sit down and everybody in the company has to agree on hiring him."

(They have lassoed eight of the 20 candidates put through the drill.)

This team attitude pervades epic's environment. "When a job comes in everyone grabs a piece of it," Vaughan said. "There are no big heads here. We were able to put together a Dr. Pepper character in record time because everyone was working on it as soon as the phone call came in. Someone started modeling the hand while someone else was working on the rest of the body."

"The work environment is great," lead animator, Tom Jordan said. "We really feed off each other."

Cherubini also has rounded up skilled young hands through its intern program established with the Academy of Science and Technology, the local magnet high school. "We've had about 40 interns since we started the company. They could make more money working at the local grocery store, but they all leave here with the knowledge and skill level to get good jobs," Cherubini explained.

An intern of epic proportions, Drew Creel is a programming whiz who has taught LightWave and Macromedia Director classes. Creel is so good at Director that he is helping to write a Director book at epic that will include a CD of 24 Director games for which he wrote 90 percent of the code. Creel graduates from high school this spring.

10% INSPIRATION AND 90% PERSPIRATION

Cherubini may have the entrepreneurial spirit of a wildcatter, but he also has the work ethic of a roughneck. Nowhere are those two characteristics more evident than in the epic tale of the Inspire 3D tutorial.

The story starts with William Vaughan who had become such an expert at LightWave that he was invited to teach it at the North Harris Community College. "I discovered it was much easier to teach somebody the concepts of 3D if I was sitting beside them and guiding them through it," Vaughan said. Hence he began developing new teaching tools.

With an idea for a LightWave tutorial in their saddlebag, Cherubini and Vaughan hit the trail to Topeka, NewTek's headquarters at the time. "William had been assembling a lot of information to help students learn LightWave, so we went up to Kansas and met with NewTek's management team," Cherubini said. "They liked what they saw and said they were developing a new product." Code named Popeil, the product became Inspire 3D.

"We thought the idea of a tutorial was ideal for an entry level program like Inspire," said Donetta Colboch, NewTek's Executive Vice President of Sales and Marketing. Epic software group not only produced the Inspire tutorial; they designed the logo and package.

"The tutorial took six months to complete," said Cherubini. "Since Inspire was new, we spent two weeks just producing sample images that we could use in the tutorial," Vaughan added.

"It's a fabulous piece of work. They have some incredible artists," Colboch said. "The tutorial makes the job of learning 3D easier. And it's done with a real sense of humor."

Epic has continued their educational efforts to support the LightWave community by providing tutorials for *NewTekniques* magazine.

They also have signed an exclusive distribution agreement with Agfa Direct, the fastest growing distributor of stock photography in the US. Agfa will market two libraries comprised of over 500 royalty free, 3D objects that the epic software group has created. The CDs will be featured in Agfa's Spring catalog and on their web site.

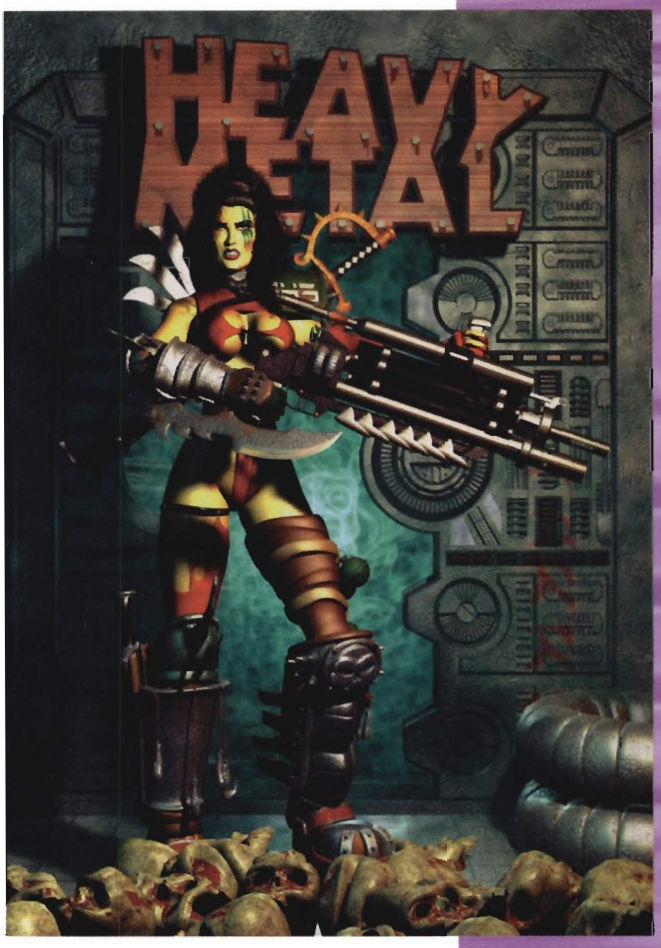
"The cost will be under $500 for 500 objects. We're marketing them like clip art," Cherubini explained. "We're doing our part for making 3D objects more readily available."

olution 3D graphics."

Epic also designed links from the CD-ROM directly to the Cap Gemini web site and even developed two interactive games. Eight thousand CDs were pressed and delivered and the digital dispatch was an instant hit with Cap Gemini and its clients. In February of 1998, this Cybercard earned epic the Gold Addy Award for the best direct mail interactive piece.

The 1997 version was such a smashing success, that in '98 Cap Gemini wanted even a bigger and better version. "One of the elements they liked from the '97 card was the replay value," Vaughan said. "So we pitched a game that you could play the year around. It was called 'Holiday Squares' after the game show 'Hollywood Squares' and it included 15 celebrities like Arnold Schwarzenegger, Madonna, Jack Nicholson, Barbra Streisand, and Michael Jackson. Once we got into it, they made it bigger. They wanted to include caricatures of 10 Cap Gemini executives that would play the celebrities. It really pushed the deadline. We ended up with 31 3D characters."

The Cap Gemini interactive greeting cards would change the course of the company's direction," Cherubini said.



A fantasy image created by the epic team.

Happy and Max

Leveraging its experience with the Cap Gemini card, epic caught the attention of Dr. Kris Jamsa, President of Jamsa Press, and an author of 80 computer books. Jamsa had an idea for a children's book series that converged perfectly with epic's skills and interests. Jamsa wanted to give his "Happy & Max" adventure series a different look by using 3D graphic illustrations. He also planned on packaging an interactive CD-ROM with the books.

"I wanted to do children's books since I was four," Vaughan said. "I buy about two children's books a week." So Vaughan was the natural choice for project manager for "Happy and Max" (Happy is the boy, Max is the Dalmatian.)

"Kurt Larson (an epic animator) did the initial pencil sketches that we sent to the authors for review," Cherubini said. "From the comments we received back, Kurt made the changes and nailed it. When the authors saw the drawings, they said that's exactly what we're looking for."

The epic crew used Inspire 3D to model and render most of the images in the four volume series which has been printed in 10 languages. "One book just came off the press in Finnish," Cherubini said. "And we just received a royalty check from the book sales in Bulgaria." Two more "Happy and Max" books are on the drawing board.

The Next Epic Chapter

Though epic is not ready to abandon its core oil and gas industry business, Cherubini and the epic software group would like to drill some wildcat wells and develop more entertainment projects. "Our future is being able to do more children's content," explained Cherubini. "We have deals in the works with people who have stories and like the look we can create for them."

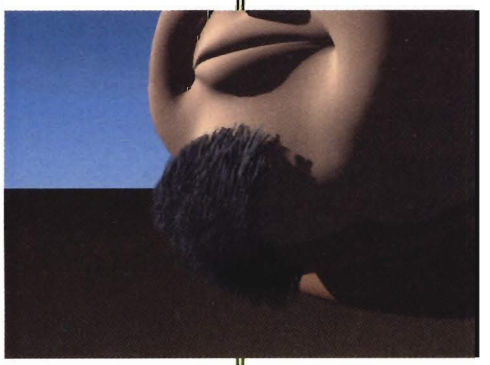
One of the ideas that is fueling their imagination is Jack Houston's *Dragon Fellow*, a 70 minute all 3D feature. "We would like to produce the entire piece in Texas," Cherubini said about the ambitious venture. "Epic has become a gathering point for animators who do not want to go to Hollywood. We have bought three and a half acres of land and plan to build a facility that will be the start of a production studio. We are designing a special building where people will want to come to work."

In the mean time, epic continues drilling for new ideas. "We went up to Dallas to visit John Davis and Keith Alcorn at DNA Productions," Cherubini said. "They suggested that we always have an animation in the works that we do for no one else except for ourselves."

As for the future, epic's explorers hope to strike black gold on the silver screen.

BY TOM JORDAN

A Hair Raising Tutorial



Ever since I started using LightWave 3D, I've wanted to put hair on my characters. Most of the business epic software brings in, however, doesn't require realistic hair styles for our models, so there was never an excuse to buy Fiber Factory or other third-party hair plug-ins. For a long time, I never even tried to create hair in LightWave because I had been told many times that you couldn't make it realistic, or it was too tedious. The hair I usually created was a stylized NURB object stuck on top of the character's head. This hair is fine for cartoony or stylized characters, but when epic got the chance to do this month's cover for *NewTekniques*, I wanted to pull out all the stops and make it awesome and realistic.

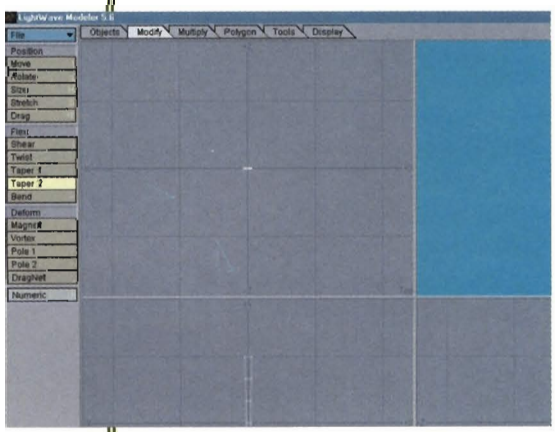


Figure 1

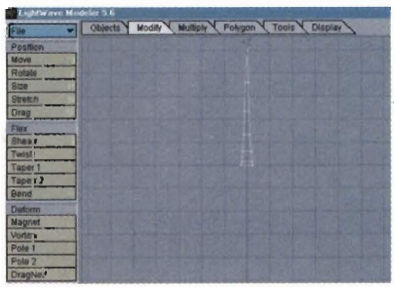


Figure 2

Our first thought was to get a copy of Fiber Factory 2, but after a few tests I realized that I might be able to pull off realistic-looking hair without using a plug-in. The first impulse most people have, if they are trying to do hair, is to make a bunch of 2-point polygons and stick 'em on the head. The problem with 2-point polygons is that they don't shade correctly in Layout and you are at the mercy of polygon/line size for the sizing of your lines. In this tutorial, we will make hair that renders correctly and looks realistic without using any third party plug-ins.

1. I am going to use the Tim Jenison model I created for the cover as an example for making the hair. Once you see how I am applying the hair, you should be able to apply hair to any of your models. Go ahead and load up your favorite character head—if you don't have one, any NURBed surface will do.

2. The key to good hair is starting off with one good hair follicle. As mentioned before, 2-point polys don't work well, so we will create our own hair follicle. Go to a new layer and create a box with the following values:

X: Low = -5 mm, High = 5 mm, Segments = 1
Y: Low = -10 cm, High = 10 cm, Segments = 6
Z: Low = 0, High = 0, Segments = 1

Press enter to make the box. Now use the Taper 2 tool to taper the lower portion of the box to a point (Figure 1). Once the box is tapered, select the bottom two points on the pointed end and weld them together. We now have a tapered plane with a sharp point. Open up the surface panel and make a double sided, smoothed surface called 'hair' and apply it to the object.

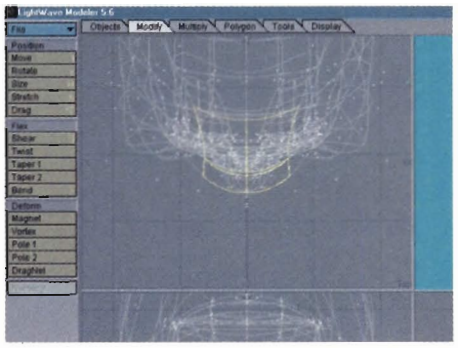


Figure 3

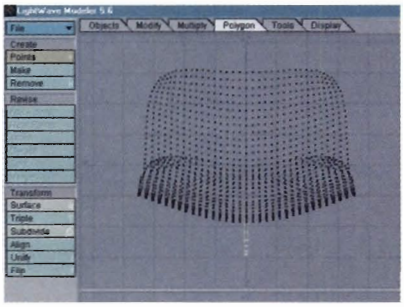


Figure 4

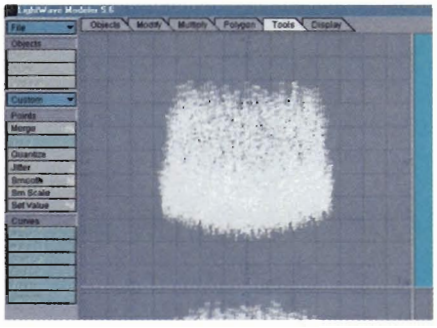


Figure 5

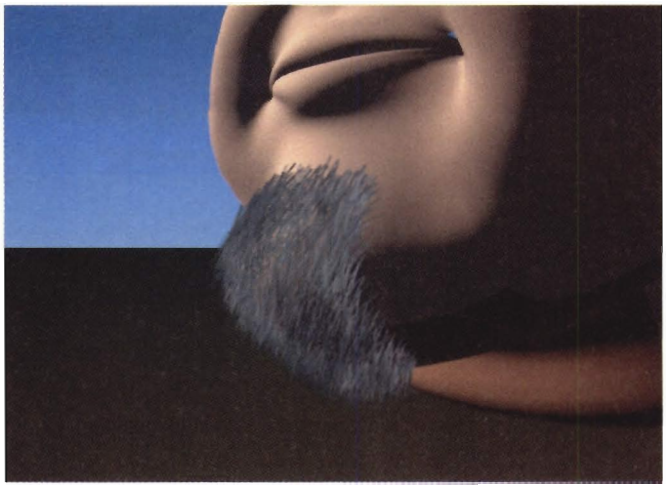


Figure 6

3. We are almost done with the follicle. All we need to do to finish it off is give it a little bend since most hairs have a natural curvature to them. Select the Bend tool, and enter these values into the numeric requestor:

Axis: Y
Range: Automatic
Sense: -
Angle: -64
Direction: 0
Center: X= 0, Y= 0, Z= -1.2 mm

We now have the base hair that we will use to create all the other hairs on our object (Figure 2). Save this hair out as 'hair follicle.lwo.'

4. Now let's jump to the layer that our head is in. For this tutorial, I am only going to create the hair on Tim Jenison's chin because the same technique can be applied everywhere else. Select the patches on your model where you want the hair to be (on Tim I selected the patches that make up the front of his chin) and copy/paste them to a new layer (Figure 3).

5. You now need to freeze the patches that you copied from your model at a patch division of 4. Once frozen, Subdivide the object twice using the Faceted selection in the Subdivide panel. The idea here is to get a fine mesh of points without going overboard. Eventually for every point you create there will be a hair, so a good mesh is required, usually between 1200 and 2500 points.

6. Press K to kill all of the polygons, leaving only the points in our object. Now switch over to the layer containing the hair follicle object. Reposition the hair so that the pointed end faces away from the chin and the curvature curves down. You will also have to shrink the hair some so that it is is proportional to the chin (Figure 4).

7. With the hair in the foreground layer and the points in the background layer, go to the Tools tab under the Custom drop down list. Select LW_Point-Clone-Plus+ and enter the following values:

Random Rotation
min H = -10, max H = 10
min P = -25, max P = 25
min B = -15, max B = 15

Random Scale
min X = .9, max X = 1.1
min Y = .8, max Y = 1.25
min Z = .8, max Z = 1.25

Random Size
min = 1.0, max = 1.25

If you press enter now, you should get a nice array of hair (Figure 5). Play with the values in the point clone plus requestor to get some different hair effects. By increasing the range of rotation, you will get more 'messed up' hair and by playing with the scale values you will get longer or shorter hair. Save your hair object

as 'hair tuft.lwo.'

8. So now you have a wad of polygons that somewhat resembles very stiff hair. Most hair that is modeled in 3D looks like what you have now. In order to soften the hair and give it the right specular highlights, we will need to jump to Layout. Go ahead and freeze your character head and load it and the hair tuft object into Layout.

9. The first thing we need to do in Layout is get the right hair texture for the hair tuft. In the photo I am working from, Tim Jenison's chin hair is mostly dark gray with an occasional dark splotch and light gray highlights. Open the Surfaces panel. The base gray color I used is: 121, 113, 113 in the Surface Color panel. To get the color variation in Tim's beard, we will need a couple of fractal noise textures in the color channel. Enter the Color Texture panel and select Fractal Noise and enter the following values:

Fractal Noise
Texture Opacity: 40%
Texture Size: X = 2 cm, Y = 2.5 cm, Z = 2 cm
Texture Color: Black
Frequencies: 3
Contrast: 1.3
Small Power: 0.5

10. Press Ctrl+C to copy this texture and press the Add New Texture button. Now press Ctrl+V to paste it into our next texture. Change the Texture Opacity to 25% and the Texture Size to X = 3 cm, Y = 3.5 cm, Z = 3 cm. Also change the color to white and punch in some random values for the Texture Center so that this texture will not be on top of our previous black texture.

11. The following values may be entered for the other texture settings:

Luminosity: 0
Diffuse: 65%
Specularity: 40%,
Color Highlights: yes
Glossiness: 64
Reflectivity: 0
Transparency: 0
Smoothing: yes
Double Sided: yes

If you look at most hair, you will see that at the edge of the hair the color gets lighter. This kind of effect can be achieved by employing the Fast Fresnel shader. Click the Advanced Options tab, and under the Shader Plug-ins drop down, select LW_Fast Fresnel and click the Options button. Since our hair is neither reflective nor transparent, deselect these buttons and highlight the Diffuse and Specular buttons. For Diffuse enter a value of 92% and for Specular enter a value of 60%. These values will make the hair appear less diffuse and more specular on the edges, thus making the edges lighter.

12. Go into the Effects Panel and under the Backdrop and Fog tab click the Gradient Backdrop button. Now go to the Camera panel, set Anti-Aliasing to Enhanced Low and make a test render. You should get something close to Figure 6. Now things are coming together, but to get that soft look we will have to do a few more things.

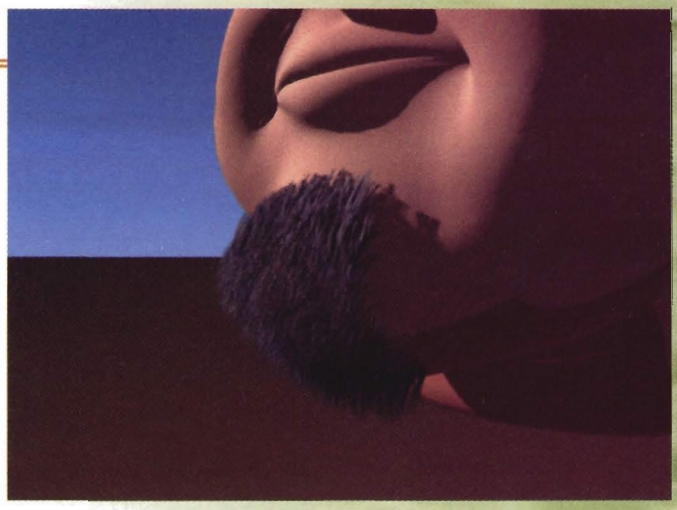


Figure 7

13. Enter the Objects panel and select the hair tuft object. Click the Displacement Map button. Select Fractal Bumps as the Texture Type and set the Texture Size to 2 cm on all axes. Set the Texture Amplitude to .005 and click on Add Reference Object to attach a null to this texture.

14. Exit the Objects panel and select the reference null you just created. Select this object's motion graph by pressing the 'm' key. Create a keyframe at frame 1 and on this key make the Y position value -14 cm and set the End Behavior to Repeat. This will move our null down 14 cm in one frame. Why am I doing this, you ask? In order to get a softer look for the hair, we will be using motion blur, but for motion blur to work there has to be motion. In this case, there is a lot of motion in a very short time, thus making the hairs seem to vibrate very quickly. This motion, while undetectable in your animations, will smooth out the hairs enough to serve our purpose.

15. Exit the motion panel and jump to the Camera Panel. Set the motion blur to 6%. If the motion blur setting is too high, you will not be able to distinguish any individual hairs, so a low setting does pretty well. Go ahead and turn on Trace Shadows and make a test render. You should get something like Figure 7.

Voila! Instant hair! Right now the hair is somewhat coarse, but this can be remedied by increasing the Anti-Aliasing level or adjusting the displacement map. To get hair on the head, simply repeat these steps for the head, using the magnet tool to shape the hair into a hair style. With proper lighting, you will have an awesome image or animation in no time, complete with hair—without a plug-in.

LightWave 301

A UNIVERSITY-LEVEL COURSE WITH INCREASINGLY DIFFICULT LIGHTWAVE TECHNIQUES

Alien Abduction: Flying Saucer

By
Scott Wheeler

Welcome back for another round of LightWave 3D fun. As promised, we will be adding some more detail to our flying saucer. We will also be adding some moving parts to the ship to give it more life.

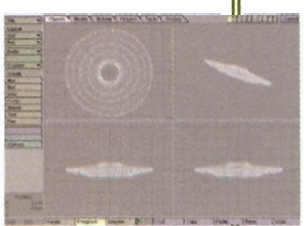


Figure 1

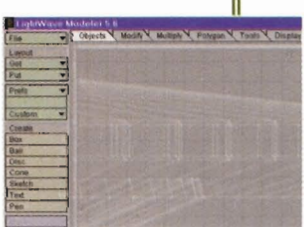


Figure 2

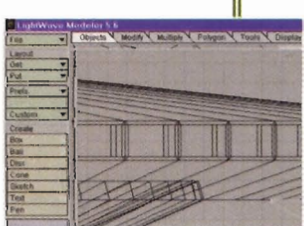


Figure 3

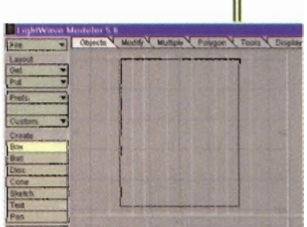


Figure 4

1. Open Modeler and Load [l] in the "TowTruckUFO.lwo" object we made last class.

Hopefully you saved it. But, if you did not or a dog ate it, you can get the object from www.uberfx.com. Once you have the UFO loaded in, Size [a] the display to fit the whole object. Just to make sure we are all in the same place your display should look like Figure 1.

The first part of adding detail to the surface is determining where we can get the most out of the geometry we will be adding. Since the shot we are creating is from the ground looking up at the UFO, we can avoid putting any more attention into the top of the saucer since we will not be seeing it. This is okay because from the viewer's perspective any detail we add to the bottom will be implied to the top.

2. Let's add our first bit of detail around the outer edge of the craft. Maximize the Left View and Zoom In [.] to the side of the craft aligning the view until it looks like Figure 2.

Note: If you hold the [alt] key down in combination with clicking and holding the [left mouse button] you will be able to slide the view around.

Switch to Layer 2 [2] and make Layer 1 the background layer [Alt - 1]. To begin this section lets start with a Box [shift - x] with the following Numeric [n] values;

	Low	High	Segments
X	-40cm	40cm	1
Y	-1.56m	-1m	1
Z	15.22m	16.22m1	

Click on OK and hit [Return] to make the box. (Don't worry, we're not just gonna put a box there.) Let's spice things up a little by moving the inside edge closer to the hull of the ship to make a wedge. To do this select the Move Tool [ctrl - t] and place it at the following coordinates:

Y: -1.05 m

Z: 15.25 m

Click and hold the [left mouse button]. Drag the mouse up until the Position read :

Y: 50 cm

Z: 0 m

Your display should now match Figure 3.

3. Now let's make a series of holes in our wedge to add some interest. Make Layer 3 the Active layer [3] and Layer 2 the Background Layer [alt - 2]. Switch back to the Orthographic view and Size To Fit [a] the object. Using all three views, make five boxes that resemble Figure 4.

As we go farther along this year I will be doing less and less actual coordinate dictating. By this stage it should be easy for you to follow along and make models that resemble those shown. Unless it is absolutely necessary, I will leave it up to you to match geometry. As always I will have objects on my web site

for you to refer to.

4. Invert the Layers ['] and Boolean [shift - b] Subtract the boxes from the wedge. Now, there is one nasty thing about Boolea: extra points. To truly finish the Boolean we should remove those points with the Merge Points [m]. You should be left with a clean detail section that resembles Figure 5.

5. Let's put our piece to double duty. Change your view to the Left View and make Layer 1 the Background Layer [alt - 1]. Zoom Back [,] so you can see the edge of the saucer.

Activate Polygon Mode [ctrl - h] and Select [left mouse button] any of the polygons on the wedge. We want to perform the next few operations on the entire object so make sure they are all selected by Selecting Connected Polygons [ ]]. Before we do anything else lets make a Copy [c] in memory of our wedge the way it is.

6. With our wedge in its current place stored in memory select the Scale Tool [shift - h]. Placing the cursor on the center of the upper edge of the wedge object, click and drag [left mouse button] the cursor until the Scale Factor reaches (120%).

7. Then, using the Rotate Tool [y] in conjunction with the Move Tool [t] to position the new wedge so that it matches Figure 6. Place the original wedge back with the Paste Tool [v].

8. I am sure you have figured out that we are adding temporal expansion bracing to the ship's hull. To complete the bracing we need to add a bridging section between the two wedges. Therefore, create a bridging section that matches Figure 7. To finish off this piece, Change Surface [q] attributes to "TowTruckUFO_BodyFlat" and click Apply.

Save this object as "TEB.lwo". I like to keep multiple stages of a model saved even if I am not going to use them as separate models. This way I can go back to any stage and make changes easier.

9. Let's add one more detail piece closer to the center of the ship. Go to Layer 3 [3] and Clear its contents by Deleting [z] them. Next, make a Box [shift - x] with the following values:

	Low	High	Segments
X	-65 cm	70 cm	1
Y	-2.3 m	-1.15 m	1
Z	10.45 m	13.5 m	1

From this box, using the techniques we have just completed for the previous detail section, create another wedge section that resembles Figure 8. Change Surface [q] to "TowTruckUFO_BodyFlat" and save the object as "DP.lwo"

10. Now that we have both of our detail sections complete, let's add them to the ship. We'll Start with the second wedge piece we made. With Active Layer 3 [3] and the Background Layer 1 [alt - 1], go to the Objects Tab and click on the Custom Pulldown Menu. Drag down the list to that command Symmeterize. What this command allows us to do is make a series of copies of object around a center point.

Note: This can also be accomplished in the Clone panel. However, sometimes it is more straight forward to use a simple single-purpose instead.

Complete the panel with the following values :
Axis: Y
Degree of Symmetry, n: 18

Click OK and notice how 18 copies of our wedge have been made around the center point. The last bit of touchup we need to do is Rotate [y] the the object five (5) degrees on the Y-Axis. This will move the sections to the center of the insets we made last class. Now, Cut [x] them from the layer, switch to Layer 1 [1] and Paste [v] them onto the UFO. Size To Fit [a] the display. Your screen should look like Figure 9.

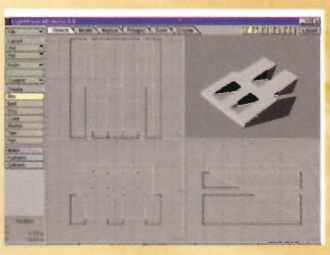


Figure 5

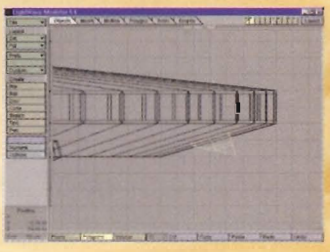


Figure 6

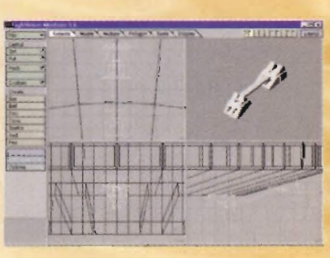


Figure 7

11. Switch to Layer 2 [2] and perform the same procedure with a slight modification.

Instead of 18 copies, make 36 copies around the Y-Axis. If all went as planned, and I know it did, your display should now look like Figure 10.

That will do it for adding any non-moving parts to the UFO. Save [shift - s] the object as "TowTruck_UFO .lwo".

Now we will be making three simple objects to put in the cutouts we made in the UFO. These will then be spun at different rates to add some life to the object.

12. First on the spin list is the side cutouts. Go to an empty layer and activate Create Points [+] and enter the following in the

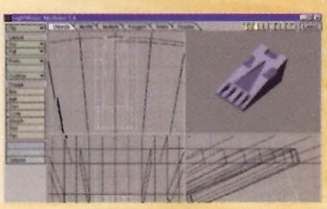


Figure 8

Figure 9

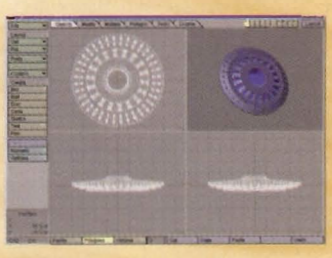


Figure 10

Numeric Requestor [n] :

X: 0 m
Y: 90 cm
Z: 19.8 m

Click OK and then hit [Return] to make the point. Next, create another point at :
X: 0 m
Y: 10 cm
Z: 19.8 m

Make a Polygon [p] out of the two points.

13. Now we need to make a disk out of our two point polygon. Activate the Lathe Tool [shift - l]. In the Numeric Requestor [n] fill in the values as shown in Figure 11. Click OK and Make [Return] the Lathe. Size To Fit [a] the window so you can see the whole ring and then select every other polygon as shown in Figure 12. You will notice that there is a polygon for both the inside and the outside of the ring. This happens because a two point polygon has no real dimension so a lathe of that object would make faces in both directions since there was no facing to begin with. No matter though, since we will be removing them shortly. Cut [x] the selected polygons.

14. We can now remove the duplicate polygons from the layer by Unifying [shift - I] them.

You should been notified that 36 polygons were removed. The only bad thing is that these were the 36 polygons that were facing outwards. So, Flip [f] the remaining polys so that they face outwards.

15. Lets create two objects from this one. First Change Surface [q] of our existing object to Match Figure 13. The exact coloring is not important since we will be changing it in Layout later. Save [shift - s] the object as "REDSpinner.lwo". Next, Change Surface [q] of our object to Match Figure 14 and Save [shift - s] the object as "GREENSpinner. lwo".

That will take care of the cutout along the outer edge of the UFO. Now lets turn our attention to the lower part of the craft in much the same way.

16. Go to an empty layer and create two points with the following values :
Point 1
X: 6 mm
Y: -72 cm
Z: 13.4 m
Point 2
X: mm
Y: -2.2 m
Z: 9.87 m

With the points in place make a two point Polygon [p]. Size To Fit [a] the display to the two point polygon and then Lathe [shift - l] it with the same settings as Figure 11 except make the number of sides 144 instead of 72.

17. In Polygon Mode [ctrl - h] select the four polygons closest to the zero-line in the Top View as shown in Figure 15. Since we don't want all four Unify [shift - I] them into two polygons and Flip [f] them so they are facing outwards. Those are the only two polygons we want to keep so lets remove the rest of them by Inverting Selected ["] and Cutting [x] the others away.

18. Since the last surface we defined was "TowTruckUFO_GreenGlow" we need only Selected on of the polygons and Change Surface [q] to "TowTruckUFO_RedGlow".T his way we have two polygons with different values to rotate around the base of the UFO. To finish this piece lets call back our old friend Symmeterize from the Objects/Custom Pulldown and fill it in to match Figure 16. Size To Fit [a] the display to show the whole disk we created. Your screen should look like Figure 17. Save [shift - s] this object as "BaseSpinner.lwo".

Next time we'll put all the parts together in Layout and add movement to them. Your homework is to get a jump on that task and play with different rotational speeds for the three spinning sections we created. Keep in mind that when we move the main UFO, we want all the spinner sections to come along for the ride. We will also be adding lights and texture to the craft so play around with that as well.

Scott Wheeler can be reached at uberscott@uberfx.com. Wheeler is one of three authors of LightWave 3D Applied, which is available in bookstores now.

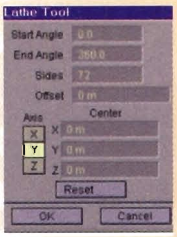


Figure 11

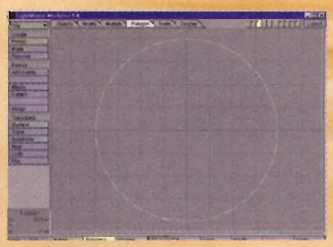


Figure 12

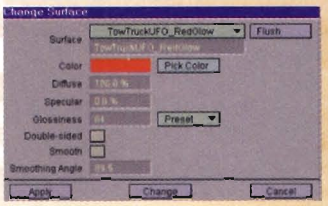


Figure 13

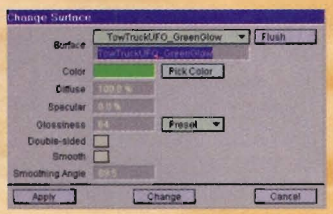


Figure 14

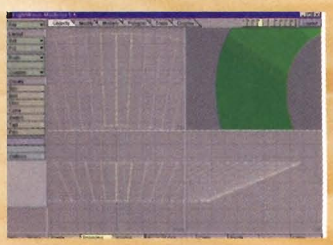


Figure 15

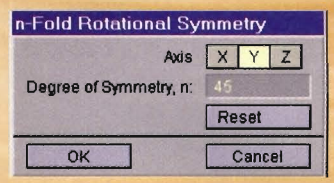


Figure 16

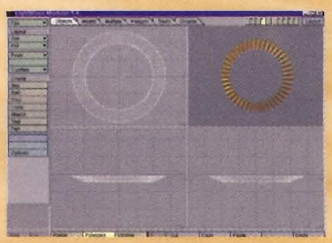
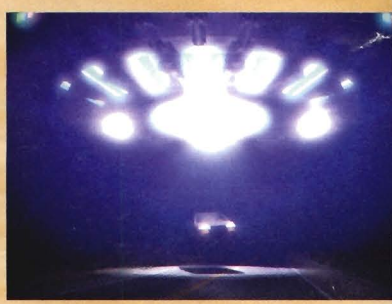


Figure 17



Super VHS ET
Super VHS ET

The Gateway

First Words

I'm a strong believer in originality and in unique approaches to creativity—and I go out of my way to apply that thinking to just about everything that I do.

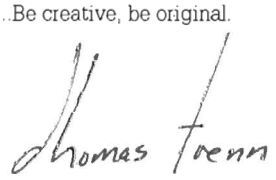
As a songwriter, one of the things that really annoys me about listening to music is recognizing a preset sound. After I buy a new synthesizer, the first thing I do is listen to all the factory sounds—to get a sense of what the device can do. Then, I erase each and every sound. I don't want to sound like everyone else who owns this same machine.

Creating my own sounds, makes a difference that is very noticeable. It's more work, but the result is well worth it. Of course, as with most things, there are exceptions to the rule—classics that go unchanged. Traditional instruments, such as piano or violin, stand the test of time; but, even those sounds can survive a bit of tweaking. I'm also a believer in pushing limits—and in trying things that don't make obvious sense. I haven't seen a manual, yet, that instructs you on how to modify or create sounds in an image processing program. But, it can be done. The computer doesn't really know the difference between audio and video, it's all just data as far as it is concerned. If you can tell a program that a sound file is an image, it will believe you.

When I hear about a new audio or video technique being used, I'm not so much interested in what is being done with it, as I am with the principles that make it possible. If you have a good understanding of what's going on behind the scenes, you will find it much easier to apply that knowledge in a new way. I spend a lot of time experimenting with new and old techniques, always hoping for a great surprise. Why? Well, mostly, because the excitement of discovering something new inspires me. Without that inspiration, I tend to get bored easily. This is also why I involve myself in so many different areas of art—a failed experiment for one art project might be the perfect motivation for another.

As Amiga users, we have access to an amazingly creative tool and to some of the best software applications available for any platform. But remember, we are not restricted to what we read in manuals or tutorials, nor to the presets that manufacturers feed us. As you read through this issue, you are going to encounter a rather unusual and, hopefully, interesting article. Unlike our usual tutorials and information articles, this one doesn't specifically tell you how to do anything. Instead, I hope that it will inspire you to think about new possibilities.

Last Words...Be creative, be original.



Dhomas Trenn, Creative Monkey

"The Gateway Online"

For more articles, visit The Gateway Online at:
www.newtekniques.com/thegateway

Cecilia is back with another great ImageFX tutorial. This time she's ready to get you started using layers and has a way to get around the lack of support for it's functions while macro recording.

Bob Ketchum takes you into the legal world, dissecting the elusive, but lucrative, video deposition assignment. It's not what you do, but what you don't do that counts when shooting this type of event videography.

Gary Heller shares some good ideas for organizing your Flyer drives as well as providing more technique tips that are sure to please.

Kevin Hanley offers advice on service pricing, including ethical ways to research your competition.

NewTek Releases Free Utilities

A new HQ6 mode for the Video Toaster Flyer is available, in experimental form, from NewTek. The new mode supports an additional megabyte of bandwidth, allowing maximum quality in many sequences where HQ5 would need to use higher compression. Flyer boards with serial numbers below 8004800 (AT&T 1C chipset) may not be compatible. In order to work properly, hard drives must be capable of sustained operation at 5.8 MB/sec. Also available is a free disk utility, called BigFoot, which allows WindowsNT users to read/write Flyer hard drives mounted on an Intel PC. And for your image processing needs, NewTek has temporarily released TVPaint 3.59, a three-layer paint and compositing program for the Amiga. TVPaint requires at least a 68030 CPU with math coprocessor, 16MB RAM, OS 3.0, and a CypberGFX compatible graphics card. All these utilities are downloadable from NewTek's web site at www.newtek.com.

Amiga Reorganizes

Jim Collas, a former senior vice president for Gateway, has taken the reigns and will integrate Amiga Inc. and Amiga International under a new corporate structure. Petro Tyschtschenko will continue on as managing director of Amiga International. Dr. Allan Havemose, vice president of engineering, is heading up a new software development center at the new administrative center in San Diego. Jeff Schindler, in charge of product strategy, is planning the new Amiga product line—reported to include new releases before the new year. Detailed product plans and new strategic partners will be announced during the summer months. Products expected include a development system, an internet appliance, and a low-cost home computer similar to the Amiga A500.

ImageFX v3.3 Free Update

Nova Design has been busy working on v3.2 bug fixes and the result is a free v3.3 update. At the time of writing, this patch was at a beta stage, but was very stable. Nova Design has also made available new public domain GIF modules that support loading and saving of GIF-Anims.

Heightened Browser Activity

The availability of source code for popular internet plug-ins has created a stir in the Amiga community. AMozilla has changed its name to aMozillaX and is expected to include support for Shockwave/Flash and RealAudio. Rather than being a direct port, the program is now being fine tuned and will include a new user interface, networking and image libraries. Compatibility with Netscape's page layout is guaranteed, with new Amiga specific code designed to increase speed and efficiency. A first generation version is now expected to be released in May 1999. The upcoming IBrowse2 is also expected to include Shockwave/Flash and JavaScript support. No release date is known at this time. Another browser is in development, called Dry Ice (formerly Water Vapour). It is expected to include HTML 4.0, JavaScript, and plug-in support.

Petro Tyschtschenko Speaks

Following the news of the changes at Amiga, Petro Tyschtschenko released an open letter to the Amiga community on what he called a historical day: "This day reminded me of the spirit of 1985, when Amiga was presented to the world public in New York." He went on to say that after almost two years since the takeover by Gateway, the waiting was almost over. "A very exciting time is coming...," he said.

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Exploring The Neglected Toaster

By Bohuš Blahut

Welcome to my first installment of Toast Master. Here we will explore the often neglected Video Toaster, the heart of the Video Toaster Flyer craze. I taught a Toaster-based production class for six years at a major art school in Chicago, and have been lucky enough to be on-hand for various training sessions and promotions over the years.

Why explore the Toaster? Isn't the Flyer all that matters these days? Nah! The Toaster is the real heart of the miracle that is the Flyer. The Flyer is impressive in its own right; but mostly, it just moves around a lot of computer data. The mixing, augmenting, and manipulation of the video signal is made possible by the humble Toaster card. Most users are fairly knowledgeable about how the Toaster works—it was meant to be that way. NewTek never made any secret of its mission: to put sophisticated television production into the unwashed hands of the ignorant masses, which includes me. Thanks to this powerful system, I've seen countless hours of Toaster-produced television. But let's be honest here; while I understand that we all have different budgets, time constraints, artistic backgrounds, etc., a hefty portion of the Toaster projects that I see are not pushing any limits.

This is where Toast Master comes in. I've been asked to reveal some of the magic that's locked up within the Video Toaster. I aim to have something to show veteran users as well as the weekend Coppola. There should be lots here for Flyer users as well. My goal is to share tips, techniques and sources of inspiration—and to help you take your video work from functional to fantastic. Having said that, let's get started!

Let's talk about a technique that I first saw in action about five years ago. Through a few easy steps, you'll be able to get CG overlays to fly in and out using the banks of digital effects already built into your Toaster. I've seen editors use this technique for a long time, but there is still some room to be creative. Let's get the basic steps out of the way, then we'll discuss creative applications for this idea. ToasterCG has long been one of the jewels in the Toaster's crown. Many early Toasters were bought by facilities needing a high-quality character generator with user-upgradeable fonts. The CG has always been simple to use, but it's also had a few limitations. Among them was the way that you can bring overlaid text on and off. The Toaster is set up to dissolve overlay credits on and off, and that's pretty much it. However, it's quite a bit more exciting to set up text that flies in and out. We'll be using ToasterCG, the Switcher, and the Luminance Keyer. The tutorial is described for v4.2; but, v3.5 users can do this, too.

Step 1. Enter ToasterCG.

Step 2. Set Page Type to Framestore.

Step 3. Choose a nice beefy font, one without too many slender details. Balloon Extra Bold, or something similar, will do.

Step 4. Type and position some text.

Step 5. Double-click on any letter to select all of the text.

Step 6. Click the Palette button.

Step 7. Set the Background to Solid and set it's RGB to black (R:0 G:0 B:0).

Step 8. Make the Text whatever solid color you like—white or pale yellow should look nice.

Step 9. We need to brighten up the Shadow and Border. Set them both to R:35 G:35 B:35. Also, make sure that their Alpha Channel levels are set to 255 (maximum opacity).

Step 10. Click Continue to return to the main toolbar.

Step 11. Set the Shadow Type to Cast

(default), Direction to Down and Length at 2 (default).

Step 12. Render the page.

Step 13. Return to the Switcher.

Step 14. With the graphic now in one of the DV buffers, we move on to making the magic happen. In Main, select whatever source you want to key the title over.

Step 15. In the Superimpose panel, select Key On Black.

Step 16. Still in the Superimpose panel, select the DV that your CG page is in.

Step 17. Adjust the Superimpose Clip Level until the edges of the overlay look good and still leave the source video 100% visible. You'll get a bit of a drop-shadow to the right and bottom.

Step 18. We want to use a digital effect next. So, bring up a Files view and go to the Effects panel. The Trajectory effects work best for this, so select that directory and double-click on the "spiral fly in" effect. There you have it—flying text! Push-Pull effects, such as "push_on_bl-tr", also work. Here's what's happening: the digital wipe is taking place between Main and Preview, as usual. However, since we're telling the Toaster that the darkest portions of the incoming video are invisible, when it does the wipe it appears as though the text is flying in. You should keep these transitions pretty speedy, because the real-time effects of the video can look a bit crunchy. The adjustments that we made to the shadow are to fix an inherent problem with the Luminance Keyer. Remember when you first brought the Toaster back to your studio, and you had visions of keying yourself into movies and such? Did you actually try it? Even if your set is lit correctly, you'll always get some weird delay artifacts to the right of whatever you're keying. Since we're keying into black, we get a black rim to the right of our text. By adding a shadow that goes straight down, we are able to camouflage the flaw, making it look like part of a classy drop-shadow.

Ready to get a little crazy?

A question came up recently on the Video Toaster Mailing List (VTML) about how to have a mouse controlled arrow on-screen to be used as a pointer—to delineate a path on a map, point out a face in a crowd, show the emergency exits in a restaurant,whatever. The procedure to make it happen is based on what we did above.

Step 1. Use the provided brush file—or in a paint program, create an arrow on a black background. You won't be able to rotate it later so make sure it's appropriate for the project. Cut the arrow out as a brush and save it as "arrow_brush". Make sure not to pick up the black background (In ToasterPaint, set the NoBkground option, before picking up the brush).

Step 2. Enter ToasterCG.

Step 3. In the file requester, choose the "arrow_brush" file. Select this brush from the pop-up menu and place it in on the page.

Step 4. Repeat steps 6, 7, and 9-17 as above. Your goal is to get the arrow to key over whatever you choose in Main.

Step 5. For the fun part of this, you'll need to use a mouse positionable effect. Bring up a Project/Files view and go to the Effects panel, select the Special directory and drag the "positionable expand" effect into your project window.

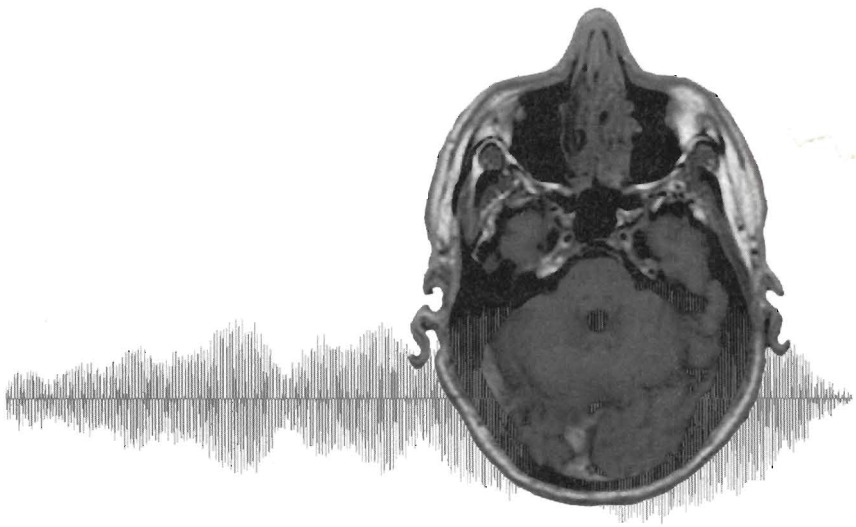
Step 6. Return to the Project/Switcher view and select the "positionable expand" icon. Left-click and hold on the T-bar while dragging the mouse. As you pull on it, the keyed arrow image will expand until it is full-size. When it is, release the mouse button.

Step 7. Now, as long as you don't hit the space bar (which would normally trigger the effect to animate), we're free to move the arrow all around the video display—even off-screen! So, all you do is record yourself moving the arrow around at the appropriate time. Do a few trial runs and then edit the good ones into your production. There are still other things to do with derivations of this technique. Next time, we'll use this same method to hide someone's identity! Of course, there will be other new ideas to share as well.

Bohus Blahut is the director of The Vantage Point and co-creator of the Catalyzer tutorial video series.

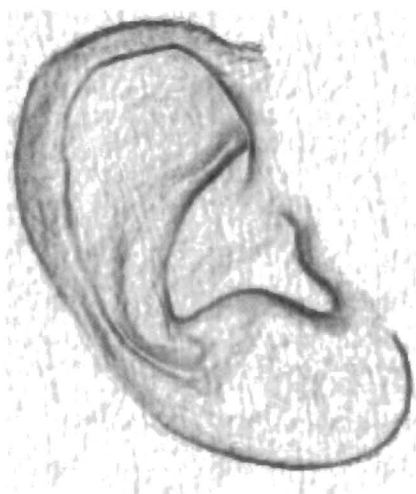
Sound Mind: A Creative Approach

By Thomas Trenn



It is common to find articles discussing the tried and true methods of using computer software and hardware to achieve a particular result. These articles often imply that there is a proper way to do things and that a recipe should be followed in order to get the best results.

Many times, this might be true—a good tutorial can go a long way to getting you on the right track. But, if you are keen to explore and delve into a different creative style, to give your work that stands-out-in-a-crowd perspective, then read on... maybe there is another approach.



Auditory Brainstem Response (ABR) reveals information about the latency, or "processing time," required by the brainstem to analyze sound stimuli.

The discussion here is based on techniques I developed for specific projects that were used to control sound synthesis equipment through MIDI (a standard communication protocol for interfacing electronic musical instruments and computers); but, the ideas could easily be applied to other applications, such as graphics and video generation.

As you read, remember that the intention is not to substitute one recipe for another; but, to open your mind to the potential of becoming your own master chef. The goal is to expose the reader to new ideas, not to detail how to accomplish a particular task. For the most part, readers will not have access to the equipment originally used for these projects. Remember, the method used is not what we are stressing here, it's the potential for inspiration. Hopefully, these ideas will be used as a starting point to something new and wonderful.

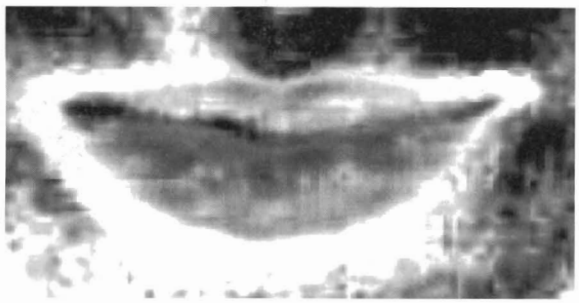
One interesting area of exploration involves the development of control systems. A control system is defined, for this purpose, as a system which monitors any type of change or stimuli and applies the response information to the control of something else.

A control source, or controller, could be as simple as the position of a pen on a drawing tablet or as complex as the monitoring of brain activity. A control system can provide data for any kind of destination, be it the control of laser lighting, visual art, or even music.

Implementing a Control System

The Amiga is an ideal platform for the development of these systems. Many Amiga applications include support for external control of functions through an ARexx port; but, to get at these features you have to be able to program in ARexx. It is beyond the scope of this article to teach the reader everything about writing an ARexx program. There are plenty of books and tutorials available. A comprehensive ARexx programming manual, written by Robin Evans, is available online. The manual is also downloadable as an AmigaGuide file. You do not have to be a programming master to implement a control system. The basic process required by the program is as follows:

1. Read control data.
2. Convert data to usable form.
3. Send converted data to an application or device.
4. Return to Step 1 and repeat.



Words or part of speech can be used to enhance the creative process.

Control data can be obtained from anywhere; the serial port, mouse, joystick or the keyboard are a few obvious examples. A very simple idea, would be to use a joystick as a device for panning sound—move the joystick left and the sound pans to the left speaker. Perhaps, moving the joystick forward turns up the volume. Although this is easily done, it is not a particularly exciting example.

Weather or Not?

Inspiration is important to the development of any project, and most artists make it a point to try to create something that looks and/or sounds unique in some way. Equally important though, is to apply your creative talents to making your project "feel" right. Any professional 3D artist will tell you that the mind perceives many things, both consciously and unconsciously. It is often the case that even the slightest details can make the difference between a result that looks real and something that looks computer generated. The audience should not have to understand, and often does not care to know, the methods behind the creation of what they are seeing or hearing. If there is a problem, they may not know what it is exactly, but they are sure to feel that something is out of place.

While working on a film project, it became necessary to create a sound that added a particularly moody atmosphere to a windy scene. Numerous attempts to create a wind-like sound using sequenced pitch changing, sound filtering and other processing had failed. Though the results were somewhat pleasing, they were mechanical sounding and seemed to be missing some level of authenticity. After much experimentation, it was decided that the humanized manipulation of the sounds was the culprit.

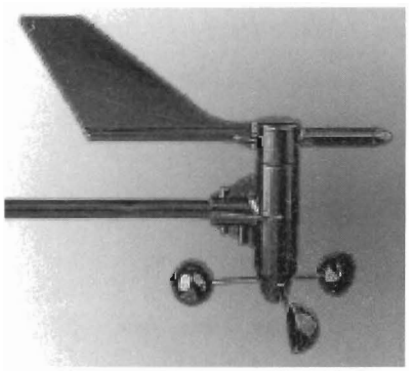
When you watch leaves, for example, being blown around by the wind, what you are seeing is not the wind itself, but the result of the wind's blow. The effect I had been trying to create, by manually manipulating sound, was based on what I could see—not what was actually happening. To achieve a more realistic effect, a control system was developed that used precision weather monitoring equipment in an outdoor environment. By applying real-time data, wind speed and direction, to the control of the sequenced sounds, a more realistic result was obtained.

Another possible application of a control system like this, is to use weather data to control computer generation of clouds (ImageFX). In this way, you could use wind speed and direction to control the rate of drift as animated clouds move across the screen. Radio Shack has introduced a consumer weather monitoring system, the WX200 Weather Station (63-1015), that can measure barometric pressure, dew point, humidity, rainfall, temperature, wind direction and wind speed. It also includes a standard serial interface, so you can easily get it connected to your Amiga.

A control source does not always have to be hardware based. You can just as easily use computer software to generate the control data. One very interesting experiment was done with the program Distant Suns, an application that provides highly accurate satellite tracking (planets, moons, comets). In addition to being a terrific astronomer's tool, it can also be used for great creative fun—such as, a control system for the manipulation of graphics and/or sound. The project involved the projection of abstract graphics onto a large backdrop, during a live musical performance. Distant Suns was used to set up a simulation of two satellites, whose orbital paths would eventually result in a collision. The two satellites were tracked through their orbital paths and their distance and velocity data was used to generate geometric patterns that changed shape and size. The simulation was designed such that the collision would occur at a peak moment during the musical performance, causing a wild display of color and abstract art.

Another particularly interesting experiment, was the result of a conversation with an audiologist about methods of testing for hearing-related problems. Auditory Evoked Potentials (AEP) are an area of tests for studying the brain's response to sound. There are different types of AEP, each of which represents a different part of the brain's response to sound stimuli. For example, Auditory Brainstem Response (ABR) reveals information about the latency, or "processing time," required by the brainstem to analyze sound stimuli. Because this response is usually consistent, ABR does not provide a useful control-source.

Another type, and one that provides a more useful control source, is called the P300. It is believed to reflect the cortical response to sound (higher level functioning /actual thinking). The P300 gives a waveform which is dependent on the subject's



Sometimes creating a realistic sound, like the wind, is better accomplished by using a scientific approach.

thoughts, while "concentrating" on different sound stimuli (e.g. frequency). To gather AEP data, electrodes are attached to the subject's head. These electrodes pick up electrical activity in the brain. There are many areas of ongoing electrical activity in the brain and so it is necessary to separate this activity (typically called noise) from the signal to be monitored. This is accomplished using signal averaging equipment, which works by adding and averaging the monitored signal over and over again. This method provides an amplification of the wanted signal, causing the signal to "grow" and the noise to "shrink". By transferring this monitored signal to a computer, this data can be used to control almost anything. An interesting application of this technique is to monitor a person's brain response while listening to a passage of music. This response is then used to control the music being listened to, allowing the person to participate in the composition of the song. Another application would involve monitoring a person while they listen to pre-recorded audio through headphones. This audio could be anything from jack-hammer sounds to classical music. The person's responses can be used to control the selection of instruments, sound effects and musical notes. These selections can be recorded by computer and used as source information for the generation of a new composition.

While we are on the topic of hearing, here's something that is very interesting, though not really usable as a control system. Audiology research has revealed many interesting things about human hearing. For example: Shepard Tones reveal a hearing obscurity that shows that two people listening to a melody in these tones, may each hear a different melody. Shepard Tones are made up of a number of sinusoidal tones, which are in octave relation to each other. They are typically constructed from frequencies which correspond to notes on

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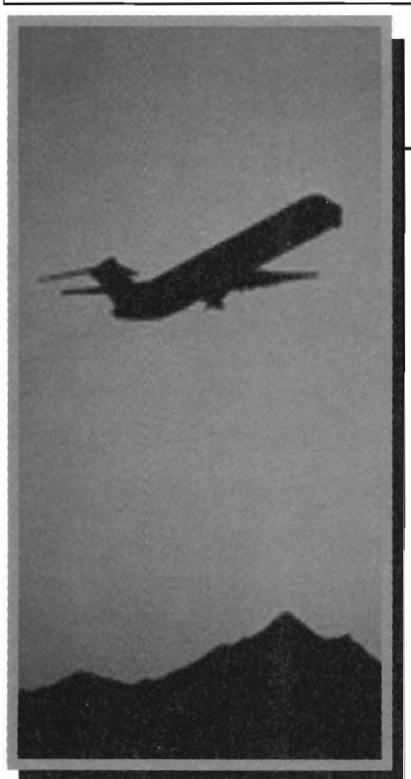

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the piano/musical scale. So, in this manner, there would be 12 possible Shepard Tones (each corresponding to one of the 12 different notes of the musical scale, from A to G#). Each of the notes is referred to as a pitch class. So, pitch class C is made up of ...C0, C1, C2... that is, all frequencies which are half of or double (octave relation) a C frequency. This applies to the other 11 notes in the musical scale, as well. Because Shepard Tones are made up of all of one pitch class, they are ambiguous in terms of how high or low their pitch is; but clear in terms of what pitch class they are. If you play one Shepard Tone pitch class, followed by another Shepard Tone pitch class, it can be difficult to determine which tone is higher in pitch than the other—some people hear high, while others hear low. This principle/phenomenon suggests that a song could be written using Shepard Tones, which would give a melody different for each listener.

A final example, and perhaps one that is more accessible to the reader, involves the generation of a database of words and sound controls (pitch bend, sound parameters, volume). For example, the word ANGER could represent a sound with short attack, above average volume, low pitch and a short sustain. Taking this one step further, the part of speech could influence the method of creation; for example, an adjective might somehow enhance the effect of the word receiving the adjective. A VERY ANGRY sound might be LOUDER than an ANGRY sound. A database of this type would allow the music composer to enter "sentences" to generate a control sequence for a composition, and to select appropriate sound structures for creating it. The database could be filled with common word associations for words such as FEAR, JOY, FLOWER, etc., based on the requirements of the composition and the composer. This idea can easily be applied to graphics... What might a PRETTY PINK FLOWER effect do to a video stream?

Not everyone has the necessary knowledge to implement these kinds of ideas on their own. But, the Amiga has always been a dream-come-true creative tool and its users are some of the most helpful people in the world. The Amiga may be living the cat's 9 lives; but, the soul of the Amiga is shared equally among its users and exists as an entity of its own. As you explore the unknown, do not hesitate to call on the public support resources that give the Amiga its breath. If you are stumped, turn to the Internet for help. Newsgroups, in particular, are a tremendous resource in finding help with the information you need. People with answers are out there, and although they might not be waiting, they are definitely listening, and generous in response.

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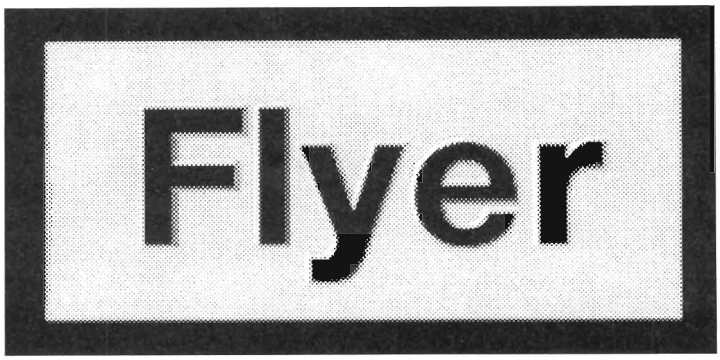

LightWave 3D An Introduction to the Boolean

By Joe Tracy

As you read through the color pages of *NewTekniques*, one thing you'll notice is that the LightWave 3D articles all deal with version 5.5 or 5.6 on Intel of the Mac. Yet most Flyer users are using LightWave 4.0 on the Amiga, which shipped with the Flyer. The differences between 4.0 and 5.5 are so drastic that it's almost like using two different programs. So for this column, I've decided to show you a cool thing or two you can do with the Amiga LightWave 4.0 to better enhance your Flyer productions. Because of space limitations, I am only showing you the extreme basics of this technique, so it is up to your creative will of experimentation to go beyond the basics to get the look and style you want.

1. Load your Flyer and from the Programs scroll-down button, select LightWave. LightWave's Layout will open. In the top right hand corner you'll see a Modeler button. Click it to load Modeler.

2. With Modeler now on your screen, click on the Custom scroll-down button on the left side and scroll down until you find Text. Move your mouse over Text and let go. A Compose Text Lines panel will open.

Note: If in the Compose Text Lines panel there are no Fonts loaded (check next to Font), then click the Cancel button to exit the panel and on the left side menu, select the Text button (second from the bottom). In this panel, you will find a Load button so that you can Load fonts into Modeler. Once you've loaded a font or two, repeat Step 2 then move on to Step 3.

3. The Compose Text Lines panel will help you easily create 3D text. As you can see, there are some custom options on this panel. Choose a Font, change the Text Type to Round, then skip down to Depth and type in 500mm.

4. In the first blank box (under Edge Width and with a > to the left of it), type in the word Flyer. Now click the OK key. You've just created 3D text! However, 3D text isn't the goal of this tutorial, but rather a side bonus you learned on the way.

   In the top right-hand corner (to the left of the Layout button), you will see two rows of small buttons. These are called Layers and allow you to create or load new objects into separate layers so that it doesn't affect what you've been working on. Think of them as separate sheets of paper.

5. Notice that the first button in the top layer is highlighted (yellow). Click the button immediately to the right of it. The Flyer text you created seems to have disappeared, but it is actually safe in Layer 1.

6. In the bottom row of layers, select the very first button. The "Flyer" text suddenly appears back on your screen, this time in the color black. This is an onion-skin type effect that allows you to "see through" the current layer.

7. From the left-hand menu, select the Box button. Now draw a box around the word "Flyer" (Face view) and leave some breathing room on all four sides.

8. From the left-hand menu, select the Make button. Your box is now complete. You may want to save the object (highly recommended).

9. From the top menu bar, select Tools. A new set of buttons appear to the left. One of the buttons is called Boolean. Click it.

10. The CSG (Boolean) panel will open. Click Subtract then OK. Your mouse pointer will read "busy" for a few seconds then the object changes to white. But something miraculous happened here.

11. From the top menu, select Display. Now from the left-hand menu, click Options. The Display Options panel opens. Under Preview click Static, then Solid. Click OK. In your upper right window you'll now see the results of your action in real time (in future sessions, make this your first step.

You'll see that the word "Flyer" has been either completely cut out (see image on page 24) or indented, giving you a whole new range of options for flying logos. To see the results better, save the object then go into Layout and load the object. Render the scene (F9) to view the results on your Program monitor.

Note: When working in LightWave 3D, it is very important that you conserve as much memory as possible (otherwise you could get a multitude of errors). One way to do this is to unload Modeler when you are working in Layout. When in Layout, you'll notice the Modeler button in the upper right-hand corner. Hold down the Shift key and click the Modeler button. You will get a message asking if you are sure you want to unload Modeler. Click Yes. Notice that the button turns gray. This signifies that Modeler is unloaded and no longer using memory.

As stated earlier, this is the extreme basic introduction to this technique. If you saved in Step 8, you can reload the object (first clear your current stuff by clicking the "New" button) to do some additional experimenting. Try using S Drill instead of Boolean in one of your experiments. Try the Boolean command again, except click Add instead of Subtract this time. Try going through the steps again, but at the end of Step 4, give your "Flyer" text a surface name (Polygon menu, Surface button) so that later, in Layout, you can change the surface (new colors, etc.). Try giving the box a surface name in the end of Step 8 so that you have control over the surface color in Layout. Try making the box 3D (Extrude button) or even use the Bevel command on it.

The possibilities are endless and your experimentation will only help you master the various ways to improve your productions.

Joe Tracy is author of the "Flyer Mastery Guide" and one of three authors of "LightWave 3D Applied - Version 5.6."

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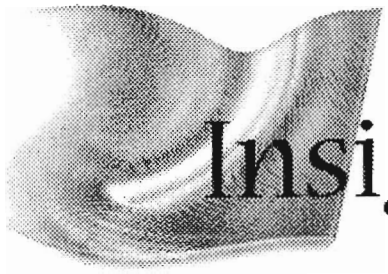

Solving the GURU

By Dhomas Trenn

One of the greatest worries of using any computer system is the seemingly random crashes that sometimes occur. On the Amiga, most of us are familiar with the flashing red or yellow alerts that appear from time to time.

It's those times when you immediately start thinking to yourself... "When did I last save this project?"

What causes a computer crash? Sometimes, crashes can be hardware related. Overheating, damaged memory or a short circuit could all cause the system to be unreliable. But, more often, the problem is related to programming errors.

If your computer mysteriously starts crashing while using applications that used to work fine, consider whether you have recently installed a new program or updated one. If so, it is possible that this new software is the culprit.

What is a GURU Meditation Error? The name probably came from the deep-thinking look that a programmer has when trying to debug a program. Basically, a GURU just means that a program has done something that the system could not handle. When the operating system progressed beyond v1.3, the GURU Meditation Error was retitled as a Software Failure (flashing red). Perhaps it sounded less technical to the general public, but the title change did not make the problem go away.

What do the GURU numbers mean? Unless you are a programmer, the meaning of the GURU error numbers will probably not be of much use. Of course, curiosity is a good thing. One of the best programs available, *The Guru*, was written by Emiel Lensink. It is freeware and in addition to decoding GURU numbers, will also tell you about DOS errors.

Is a Recoverable Alert a good thing? Recoverable Alerts (flashing yellow) were introduced to accommodate the idea that some errors do not corrupt the entire system. Although the intention is good, in my experience, Recoverable Alerts always lead to inevitable doom. If you are really lucky, a Recoverable Alert might allow you to save your current project, but it is likely to result in lost data.

If you encounter a Recoverable Alert the safest thing to do is reboot. But, If you are worried about losing your work, use SAVE AS with a new project name. That way, if the save does fail, at least you still have the previously saved work. It is also a good idea to save the project to a different hard drive or partition. If you can, it's helpful to have a partition just for temporary files and for when these problems occur. After you save your work reboot the computer. Don't let the Recoverable Alert fool you. It's a bad thing, indeed.

What can be done about this? The most common cause of system crashes is the mismanagement of memory. When a program needs memory, it has to request it from the system. Usually, a program should only access it's allotted memory. Sometimes, though, a bad program will attempt to use memory that does not belong to it. In the worst cases, this can cause the operating system, orother programs, to get seriously confused.

A good watchdog for these problems is a program called Enforcer (or Cyberguard). It is generally considered a programmer's tool, but anyone can benefit from its use. Before testing a new application, start Enforcer like this:

```
Enforcer STACKLINES=0 FILE=CON:0/0/640/150/Enforcer/Auto/Close
```

While it is active, Enforcer protects the most important memory areas,and if it detects a memory problem it will open a window and give areport like this:

```
LONG-WRITE to 00000102
PC: 085FF746USP: 088847C8 SR: 0014
FLSW: 00810200 TCB: 088836F0
Data: 00000000 DDDD1111 DDDD2222 DDDD3333 085FF6E2
Addr: AAAA0000 AAAA1111 AAAA2222 AAAA3333
AAAA4444...----> 085FF746 - "LawBreaker" Hunk 0000 Offset
00000086----> $085ff746: MOVE.L D0,$0102.WName:
"LawBreaker" Hunk 0000 Offset 00000086
```

If that looks like total gibberish to you, do not worry. You need only be concerned by the last line, which tells you what program caused the problem—in this case, "LawBreaker." If the first line indicates a WRITE operation, as this one does, you can expect trouble. If it is a READ operation, things are not as bad, but are not great either.

If Enforcer detects a bad program, you should try to contact the author and report the problem. Unfortunately, that isn't always possible, particularly if a programmer has stopped developing the program. It is a good rule of thumb to avoid using programs that generate Enforcer hits.

Enforcer can be started from your user-startup to be on-guard all the time. Doing this may slow down your system a very small amount, but the protection it offers might be well worth it. It is not a complete solution, but Enforcer is a very good tool to troubleshoot mysterious system crashes.

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by Joe Tracy

The Ultimate Flyer Demo Reel

"The Ultimate Flyer Demo Reel," assembled by Kevin Hanley of Creative Video Works, is not the most exciting two and a half hours you'll ever spend watching a ow. However, this video does something that no one had previous- ried—it assembles the work of many Flyer video producers into one pe to answer the question, "What are other Flyer producers creat- g?" And this is where the video shines.

The tape, which sells for $15 (including ipping and handling), was the brainchild Hanley, who advertised online for Flyer oducers to send in their demo reels for e production. There were 20 responses, cluding well-known names like Bohus ahut, Paul Lara, Michael Holten (Aussie), d Dave Hebel. All 20 demos are included "The Ultimate Flyer Demo Reel." Hanley eated introduction screens for each sec- n, then let the content of the videos do e rest of the work. The result is two-fold: hile some footage is fun to watch, other otage almost puts you to sleep. I suppose u could also add a third group called otally bizarre." It's definitely a good study both what to do when creating a reel d what not to do.

There were two demo reels that really od out in my mind. The first was by PJ rdmann. His use of quick cuts synced to usic from *Mission Impossible* not only as well done, but actually caught the eye other members of my household who ere playing computer games at the time d stopped to watch it. This is a good example of how to Keep It Short and Simple (KISS). It is a demo with replay value and that's exactly what it got as I rewound the tape and watched that segment again. All it needs is more examples of the full services offered to be near perfect. The other one that I found very well done was the demo video by Hanley. In particular, his introduction was very creative and classy.

I was surprised that many people didn't submit demo videos, but rather completed projects (corporate videos, etc.). My complaints about this are limited because one of the videos I've long wanted to see is Michael Holten's "Discover China Today," which he did for the People's Republic of China. It's on "The Ultimate Flyer Demo Reel!"

There were some excellent television commercials on the video, like "Farley's" by Joe Simons of Mind Composers, Inc. This is a good commercial (as are others) because it shows good use of close-ups and smooth panning. For simple fun, I enjoyed seeing "Anime Central" by Bohus Blahut. From Dave Hebel came Dimensional Technologies "The Next Level" video. Not only was it good (I had also seen it a year ago), but I almost purchased Composite Studio and FlyFX after seeing the demo. Now that's effective marketing.

I noticed that many producers are using products like Photoshop and After Effects to complement their videos. The added professional appearance this gives the finished result is very apparent. I also saw a lot of use of products like ImageFX, Club Toaster and other third party programs. Good stuff.

I thought that "The Ultimate Flyer Demo Video" was definitely worth the $15 it costs to buy. You may be pressing your remote's fast forward button in some spots, but others will entertain and inspire. Some will even have you wondering if the Flyer was really used as you frantically try to recreate the effect on your own Flyer system.

You can order the video online from www.creativevideoworks.com or by calling 405-360-6456. Hanley is currently working on "The Ultimate Flyer Demo Video II" and is accepting submissions. Every producer should have a demo reel, so I hope to see more in the sequel. You can send your demo reel to Hanley at Creative Video Works, P.O. Box 721112, Norman, OK 73070.

Joe Tracy is author of Joe Tracy's Flyer Mastery Guide, available through authorized NewTek dealers and resellers. He is also one of three authors of LightWave 3D Applied, Version 5.6.

Flyer Mastery Guide - Version 2.0

BY THOMAS TRENN

I was surprised when I opened up the very well packed shipping box, that my "Flyer Mastery Guide 2.0" had arrived in, to find that it was not a book in the traditional sense, but a manual in a three-ring binder instead. Despite the safe packing, the binder suffered from one slightly offset ring; but, nothing that a hefty pair of pliers wasn't able to fix quickly.

Once I realized this was not your normal book, however, the reasoning behind the guide being in binder form became very clear. Much like software products, the "Flyer Mastery Guide" is a continually growing product. Every copy is registered, and when minor upgrades become available, you just have to insert the updated pages into the binder—a much cheaper solution than having to buy a whole new book every time there is an update.

WHAT'S INSIDE?

The guide is divided into ten chapters:

1. Mastering the Basics & Beyond

A very good tutorial introduction to using each of the Video Toaster Flyer's main functions: recording, editing, project building, character generation and applying special-fx filters. There's also some quick tips and information about functions you may not have realized you had.

2. Optimizing Your Flyer

A detailed discussion about Flyer hardware, including information about signal calibration, proper connections, additional hardware recommendations, and using the FlyerHDTools to set up your video and audio drives.

3. Learning From Flyer Tutorials

Nineteen tutorials teaching you about: building image displays; video special-fx; 3D and curved text; titling, listing and scrolling text effects; blue screen technique; letterboxing; placing flyer clips onto 3D objects, picture-in-picture; and lots more.

4. Learning LightWave 3D

LightWave is one program that you could never have enough tutorials about. In addition to those included in the previous chapter, here you will find a basic introduction to LightWave - beginning with a tutorial that walks you through making your first Flyer animation. Following that, are four more tutorials which take you through modeling, Layout, object rotation, and the creation of glowing effects.

5. Mastering the Flyer CD-ROM

On the included CD-ROM you will find 620MB of bonus material, including almost 200 backdrops and images (plus graphic indexes), over 150 objects for use with LightWave 3D and for creating brushes, and a stunning fractal landscape example sequence. Rather than just leaving it up to you to figure out what to do with everything, this chapter gives you some good information about putting it all to good use.

6. Flyer Tips & Shortcuts

More than 80 time-saving and helpful ideas, presented in a tutorial step-by-step manner.

7. Fixing Flyer Problems

On a system as powerful as the Flyer is, there's sure to be unexpected problems from time to time. Here you find good advice, suggestions and trouble shooting tips based on many years of experience.

8. Third Party Products

There are a lot of enhancements that can be made to your Flyer system through third party products. Here you find an overview of many of these products, including contact information for each company; pricing and feature lists for each product; and in some cases, tutorials. A nice addition.

9. Video Marketing 101

You can't successfully operate a business if you don't make the effort to market yourself, "selling a product is 80% marketing and 20% product." In this chapter, you find out the why and the how to.

10. The Next Level

Like myself...the author is an entrepreneur; a researcher; an artist; and most importantly, a dreamer - all rolled into one. In the final chapter, he talks about that and also gives some insight into the world of video, the Flyer and NewTek.

Appendices

It doesn't end there. Following a helpful index, there's five appendices of additional surprise information. I won't spoil the fun by telling you what that's all about.

CONCLUSIONS

In a letter to the reader, the author, Joe Tracy, said "I've spent hundreds of hours trying to make this the best possible tool of knowledge for you and your system." - He wasn't kidding. Any developer will tell you, and I speak from personal experience, one of the most time consuming parts of developing a product, is creating a good manual.

For both newcomers and long-time users, there's a great deal of information contained in this guide that you won't find anywhere else. There's so much information in fact, that you could never remember it all. You will want to read this book over and over again and keep referring back to it.

As if the incredible effort put into this huge reference book wasn't already enough, Joe even added the special touch of personally signing every copy. If Joe had the time, I'm sure he'd hand deliver the book to each customer, and sit down with you to make sure you got the most out of it.

"Joe Tracy's Flyer Master Guide" is a tremendous effort in every way—a highly recommended reference guide. You can get it through most dealers (check www.studiovisions.com for a list) or by calling 1-800-672-1880. It retails for $129 new and less if you are upgrading from version 1.0.

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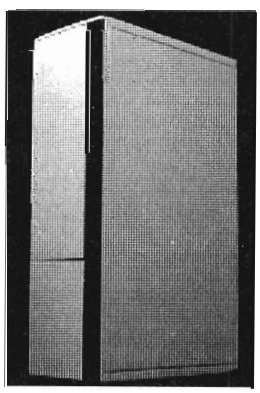

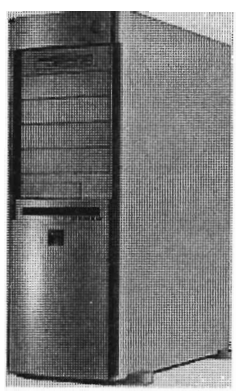

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Circle #209

Fun with Explosions: Part 2 Turning Up the Volume

BY DAVE JERRARD

In "Fun with Explosions: Part 1" we covered the basics of creating an interesting particle explosion, then dressed it up a little with some glows and a shock ring. Now we'll "turn up the volume" and fill out the explosion a little more with the addition of some fiery gaseous effects. After all, there's more to a good explosion than a bunch of pretty sparks!

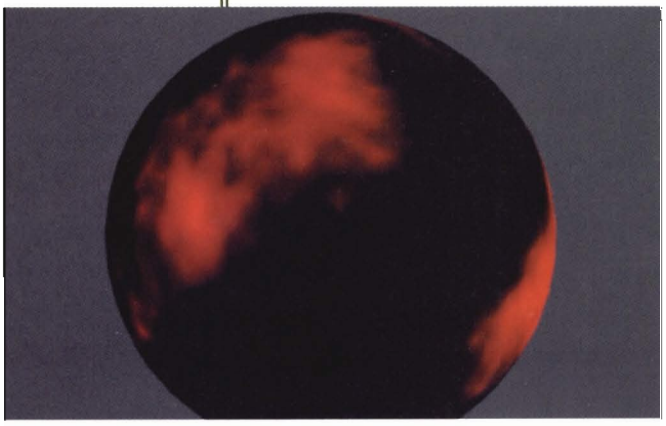

Figure 1. Our fireball starts out looking more like a fancy bowling ball.

Figure 2. The same sphere, scaled by a factor of 5, and again by a factor of 11, showing how the texture changes and fades.

There's several ways to add these gaseous, volumetric effects, especially since we have plug-ins like Steamer, Genesis, WaveFilter, HyperVoxels, and SuperGlow. Unless you're planning on rendering in layers and assembling them in a compositor later (something that not everyone has access to), some of these can be quite frustrating. Instead, we'll focus on tools that are included with LightWave 3D.

1. Before we can continue from where we left off last time, we need to do a small amount of modeling again. Start up Modeler. To create a fiery volume, we'll use an old, but effective trick involving semi-transparent spheres. Select the Ball tool and open the Numeric Panel for it. Click the Reset button to remove any previous data, then select the Tessellation Ball Type, and enter a Level of 3. The remaining default values will do for now, so click OK and hit Enter to create a sphere. Save this as ExplosionSphere.lwo, then move over to Layout.

2. If you haven't already, clear the scene, then load the sphere we just created. Our task now is to make this round ball look like a fireball, so open the Surface Panel and rename the surface to Explosion Sphere (there should be only one surface present at this time). We'll do a typical orange-red fireball for now so we'll start with a bright red base color. The following surface values will get us started nicely:

Figure 3. The sphere changes from bright yellow to a deep red as its surface moves further from the texture center, which is located at the center of the smallest sphere.

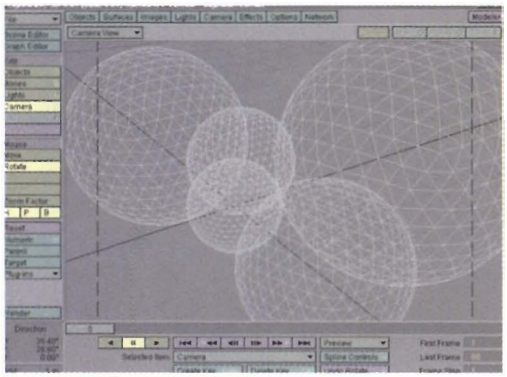

Figure 4. A Layout view of a test cluster of fireballs.

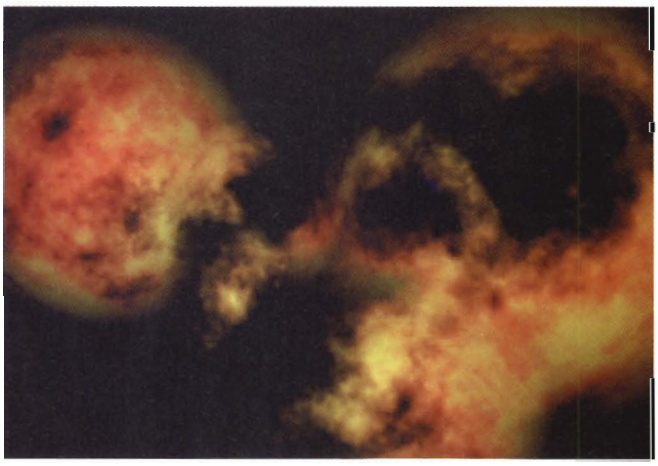

Figure 5. The effect of the Edge Transparency on the cluster, showing how they seem to merge together

Surface Color: 200 30 30
Luminosity: 0%
Diffuse Level: 0%
Transparency: 0%
Smoothing: on

Currently, with both the Diffuse Level and Luminosity set to 0, this gives us a black ball that will be invisible against a black background. This is intentional since it forms the basis for the next few steps. When we use the fireball we'll be expanding it over time, and we want it to gradually fade from brilliant yellows to cooler reds as it expands. The values we've just supplied form the 'cool' end of that transition. Now for the hot center...

3. The first thing we need to do is make this ball visible. Fireballs tend to give off light, so we'll give ours some luminosity. Open the Luminosity Texture Panel and select Fractal Noise. We'll use this texture to bring our fireball to life. We'll stick with the default Texture Size, but we'll raise the Texture Value to 300%. With a value that high, the texture will have more detailed edges, as well as being much brighter than usual. We'll increase the sharpness of the texture even further by raising the Frequencies to 6, Contrast to 1.5 and the Small Power to 6. A test render will show that this Luminosity texture now reveals the red base color we applied in the last step. (Figure 1)

Note: The frequency value of Fractal Noise can go as high as 8. Values higher than this will have no further effect.

We have two more setting to modify on this texture. First, activate World Coordinates, since we'll be moving this sphere through the texture later, and second, apply a Texture Falloff of 10% to all three axes. This will give us our gradual burnout as the ball's surface moves further away from the Texture Center. (Figure 2)

This Luminosity texture isn't absolutely necessary, since interesting results can be achieved by simply applying a base 300% luminosity to the entire surface. We've added this texture mainly to break up the effect, in order to help camouflage the sphere later.

4. Now that we have some luminosity applied, we can add some color. Open the Color Texture Panel and select Fractal Noise again. This time we'll apply a bright yellow color, which will blend with the red base color for a vibrant fiery texture. The following values will do nicely:

Fractal noise
Texture Size: 50 cm
Texture Falloff: 10
World Coordinates: on
Texture Color: 245 255 105
Frequencies: 6
Contrast: 1
Small Power: 0.7

Just as we did in the last step, we're using a Texture Falloff to change the color as the sphere expands. We've also used a different Texture

Size to prevent this texture from matching with the Luminosity texture. Figure 3 shows how the color and intensity are changed as the surface moves out from the center.

5. This is starting to look much more like fire now, but we need to make it look less round. To get a better idea of what's happening now, make two or three clones of this object and place them randomly around the first one, allowing them to overlap, as in figure 4. Feel free to scale them as well.

If we were to render this now, it would look more like a science model of some strange molecule than a fiery explosion, so the next detail we need to take care of is the hard edge of the spheres. Click the Advanced Options tab and then click the Transparent button for Edge Transparency. This will make the balls semi-transparent, based on the surface angle to the camera. As the surface turns further away from the camera, it becomes more transparent, creating the illusion of mass of glowing gas. (Figure 5)

You can also see now how the luminosity texture breaks everything up, somewhat obscuring the spherical nature of the objects.

6. The texture is still a bit on the smooth side, so we'll roughen things up a bit. Fireballs tend to expand with a rolling, billowing surface, which we can simulate by adding a Bump Map. Select the Crumple Texture, and give this a value of -25% and a Texture Size of 5 meters. Raise the Number of Scales to 6 and the Small Power to 1 to add more detail to the texture since this is fairly large. Once again, activate World Coordinates so the surface can move through the texture. By using a negative value for the Texture Amplitude, the texture will have a rounded lumpy appearance, rather than a jagged rocky one.

Normally a luminous surface like this would not be modified by the addition of a bump map since it's not being affected by any directional light to shade the bumps. However, we do have the Polygon Edge Transparency active, which applies transparency to a surface according the angle of the surface normal. Since a bump map actually modifies the surface normal to simulate bumps, our Edge Transparency will also be modified. (Figure 6)

The Texture Amplitude is applied with a low value intentionally here. This is so we can exploit an interesting bug in the Crumple texture itself. As an object changes scale, unlike other bump textures, the amplitude of Crumple (as well as Crust, Bump Array and Veins) will also scale, growing deeper as

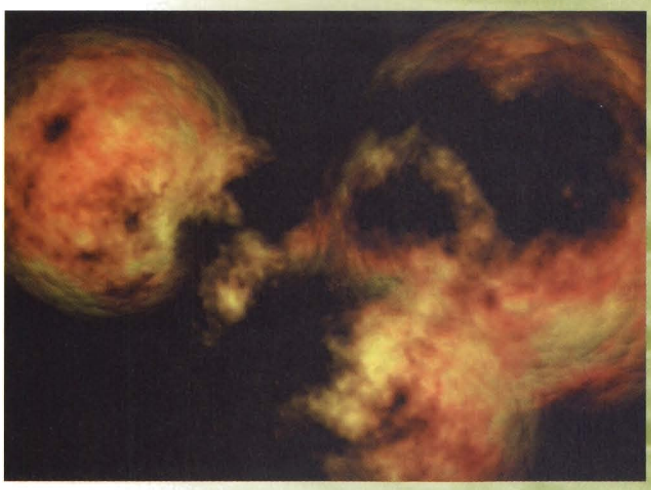

Figure 6. The same cluster, this time with a Crumple bump map applied to add a billowing effect.

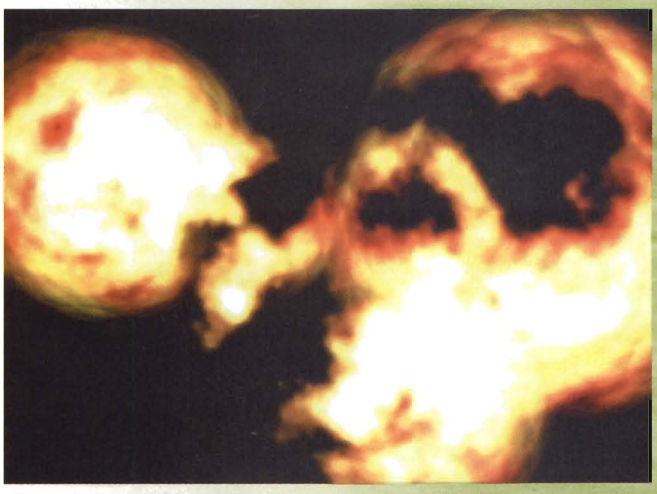

Figure 7. A glow around the spheres adds a nice final touch, blending the spheres together even more.

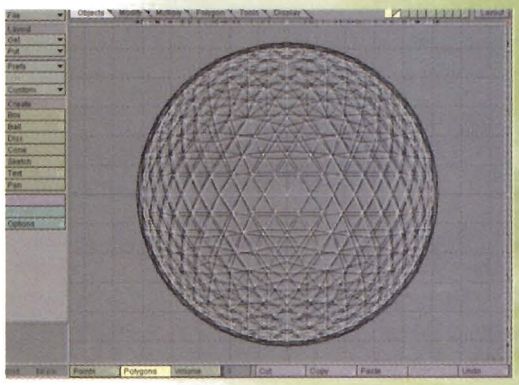

Figure 8. A second sphere, shown here in the black, will be used to scatter burning debris around the fire.

the object grows, and vise versa. This works well in the case of our fireballs since as they expand outwards, the billowing effect will become even more prominent.

7. The last thing we'll do to this surface for now is apply a glow to it. Remember, in the explosion scene we created in part 1, we had a glow effect applied with an intensity of 1000. If these fireballs are going to be added to that scene, we should allow for that glow as well. Open the Effects Panel and activate the Glow Effect. Raise the Glow Intensity to 1000% and set the Glow Radius to 12 pixels (for video resolution), just as we did in part 1. Now, open the Surface Panel again and click the Advanced Option tab. If we rendered a frame now, the glow effect would completely wash out the frame due to its high intensity. We can alter that here by lowering the Glow Effect amount for this surface to 10%. This will now apply the glow as if it were only set to a global value of 100% (10% of 1000 = 100). Now our fireballs will look much hotter! (Figure 7)

Now that we have a glow on the spheres, some of the detail in them ends up being washed out in places. We also want to have the fire start to dissipate a bit more as the spheres expand, to give the illusion of the flames breaking apart. Also, a fireball like this would tend to create a lot of waste material, like smoke and burning debris, which is the main reason we didn't make this surface Additive like we did with the shock ring. If it was additive, anything on the other side would be visible though the flames, which would ruin the illusion of thick fire. As our fireballs are now, they are still a bit on the transparent side, though this becomes less noticeable where they overlap. We need to add a little more material to them to thicken them up a bit, so, back to Modeler we go.

8. Clear out the original ExplosionSphere object and then use the GET command to load one of the sphere we have in Layout. This will load the current surface information into Modeler as well so we don't inadvertently lose it. Now, copy this sphere to a second layer and use the Size tool to scale it up to 104%, so it's just slightly larger than the original. (Figure 8)

Next, open the Surface panel and select the Default surface, then rename it to ExplosionSphere-dark. Now, holding the Shift key, select both the current layer and the one we just copied this from, then use the Put command to send these layers back over to Layout, replacing each of the spheres we already have there. Finally, return to Layout.

9. You should now have a cluster of spheres, just as before, but this time they should all be doubled up. Open the Surface Panel and select the new surface we just created. This surface will be used to fill the explosion with 'dark matter', such as thick black smoke and debris, as well as to break up the surface of the fire even more. The first thing to do is to make sure that both the Luminosity and the Diffuse Level are both at 0% again. We want this surface to be completely black all over since we'll use it to absorb some of the excess light that we have in our explosion. In fact, the only surface attribute we really need to concern ourselves with now is Transparency.

Set the base Transparency to 25% and open the Transparency Texture Panel. Once again, select Fractal Noise and give this a Texture Value of 200%. As before, this high value helps keep the texture detail sharp, but it also increases the amount of transparent area of the surface. Raise the Frequencies to 8 and set the Contrast and Small Power both to 1. Activate World Coordinates again and then click the Texture Size button. Since we have a few layers of various Fractal Noises started to pile up, it's important that each be set up differently. Otherwise, the textures will match up with previous textures, with the newer ones obscuring the older ones. One easy way to make sure the textures aren't going to be identical is to keep the sizes different. Another way, especially if you absolutely have to use the same size, is to make one or more of the sizes a negative value. This will keep the texture the same size, but have the effect of flipping it on an axis. With this in mind, make this texture 2 meters on each axis, but make one or more of these a negative value.

To finish this surface off, go to the Advanced Options tab and set the Edge Transparency to Transparent. The outer spheres will now have a surface that looks like black clouds. (Figure 9)

While we're here, make sure that the Glow Effect is set to 0% since we don't want this surface to contribute to the glow we already have, but rather tone it down in places. Since this surface does not have any glow applied, the transparency texture will act as a mask on the underlying glow, letting the full effect shine through the transparent areas, while blocking it in others. (Figure 10)

10. Well, now that our fireballs are fully textured, let's put them into action. Save one of these again (it doesn't matter which since they're all the same) so you don't lose the surface information, then load up the explosion scene we created in "Fun with Explosions: Part 1."

11. After loading the scene, it's time to add some fire. Load the ExplosionSphere that we

just created and parent it to the Handle null that the rest of the explosion elements are parented to. Now we have one last texture detail to take care of. Since every texture on the ExplosionSphere uses World Coordinates, we can't move the explosion itself without affecting the look of the fireball. To fix this, we'll use the Handle Null as a reference object for each texture. Simply go through the four textures we've applied, and select Handle Null as the reference object. Now, since the sphere itself is parented to this null, whenever the null is moved, the sphere will follow, as will the textures that are applied to it. The sphere can also be moved on its own and still move through its textures, in much the same way the shock ring works.

12. To create a fiery explosion, we'll use several copies of this ball, but before we start making clones and applying the motions to each one separately, let's set them up for this current object. The first thing to do is scale the ball down to 0% at frame 0 so we can expand it later. Next we need to create a second identical keyframe at frame 1 and set the Spline control to Linear. This creates the extra frame we'll need in order to shift all the keyframes later for timing, as we did with everything else in the scene in part 1.

Our explosion starts off with a brilliant flash of light, then the particles spray out, surrounded in a bright glow. The fireball should begin to appear just as the particles disperse enough that they no longer create a glowing blob on the screen. Since this would happen about ten frames after the flash, so we can actually shift that second key a few frames later in order to delay the expansion slightly. Create a third identical key at frame 100, which will be the end of the explosion. While we're here, set the Spline Controls for these keys to Linear to prevent any unwanted scaling before the explosion.

13. We're also going to want to set up a dissolve envelope for the sphere so we can fade it out toward the end of the explosion. Open the Dissolve Envelope for the sphere and create a keyframe around frame 50 with a value of 0%. Create another key at frame 100 with a value of 100%. Finally, set the tension of both of these keys to 1.0 so we have a nice S-shaped curve. (Figure 11)

14. Now that we have a few initial keyframes set up, we can start cloning. In the Objects Panel, click the Clone Object button and create about ten clones. The more clones we have, the better the explosion will look, but the longer it will take as well. eight to 16 spheres will work well. Each clone created will also

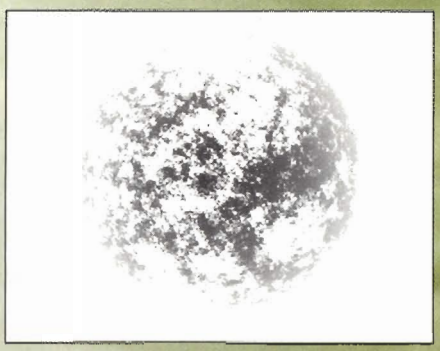

Figure 9. An isolated view of the outer shell of the explosion showing the fractal transparency which will add detail to the glow.

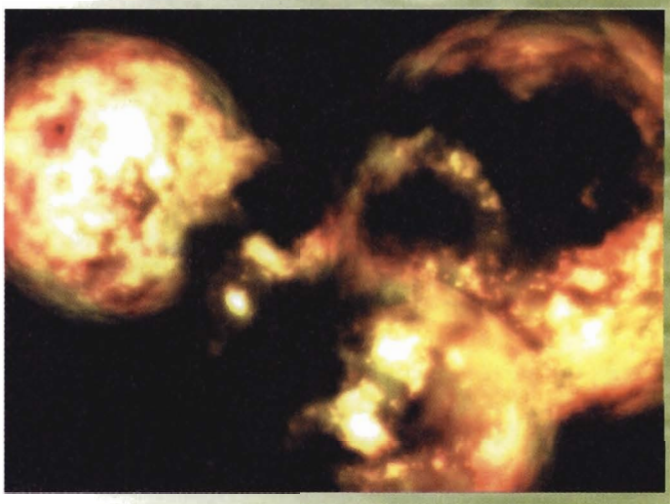

Figure 10. A second surface helps to make the fireballs look a bit dirtier.

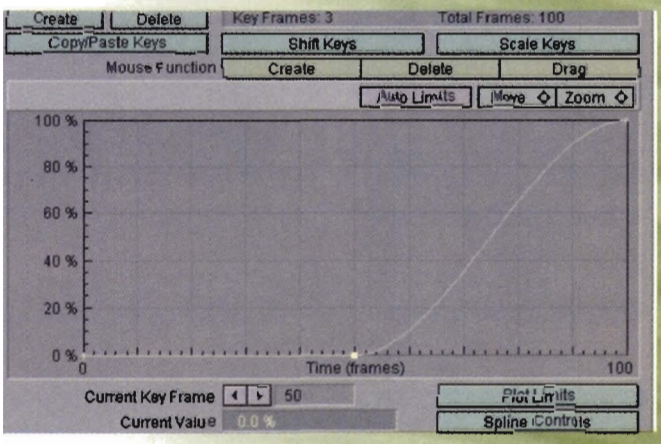

Figure 11. A simple dissolve envelope for the fireball.

have the same graphs applied to it that the original had, saving us several steps for each object. Now we're ready to animate!

15. Working directly in Layout now, advance to frame 100, then scale the first sphere to three to six times its original size. This first sphere should not do much more than simply expand in place. Make sure you have Auto Key Adjust activated in the Options Panel so all the adjustments you make on this frame stay put.

16. Select the next sphere and scale it as well. This time move it away from the Handle Null slightly as well, keeping it close to the first sphere. Ideally, they should overlap slightly. Repeat this for each sphere in the scene, taking care to disperse them evenly and keep them all slightly overlapping one another. (Figure 12a)

Remember that, as the spheres get further away from the Handle Null, they're moving through their textures as well. The further they move, the less texture that is applied due to the Texture Falloff values we gave them. This will cause them to gradually fade to red as they expand outwards, while the spheres near the center will retain their yellowish appearance.

17. When all the spheres have had their final keys created, generate a preview and watch for any spheres that move too fast, or just don't look right. If they move too fast, the texture on the surface will change too quickly as well, losing the rolling fire effect that you get with slower speeds. As long as the spheres don't split up as they expand, they'll look like one large expanding fiery explosion. (Figure 12b)

To improve this effect even more, stagger the envelopes for each sphere so they dissolve at different rates, or begin expanding at different times. Try making a few spheres expand slowly, then a few frames later, have another bunch expand more rapidly so they pass through the slower ones over time. Another technique to try is to move the pivot points of each sphere by about 25 centimeters or so, and randomly rotate each one as it expands. This will cause them to wobble as they move out, giving the illusion that some areas of the explosion are being sucked back in while other area burst outwards over a few frames. Above all, have fun, and enjoy blowing things up!

Dave Jerrard is the lead tutorial writer for NewTekniques *magazine, and is one of the authors of LightWave 3D Applied, which is in bookstores now.*

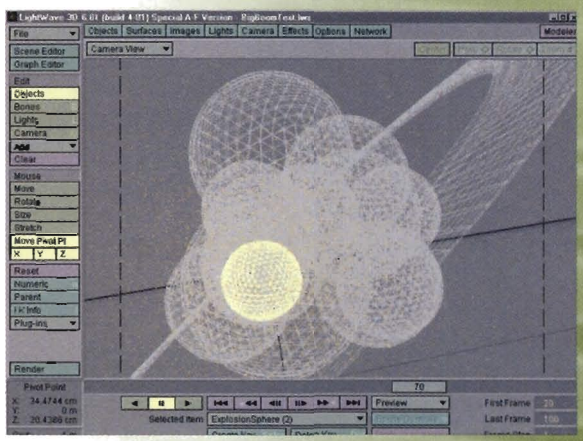

Figure 12a. A large cluster of fireballs randomly distributed around the center point of the explosion.

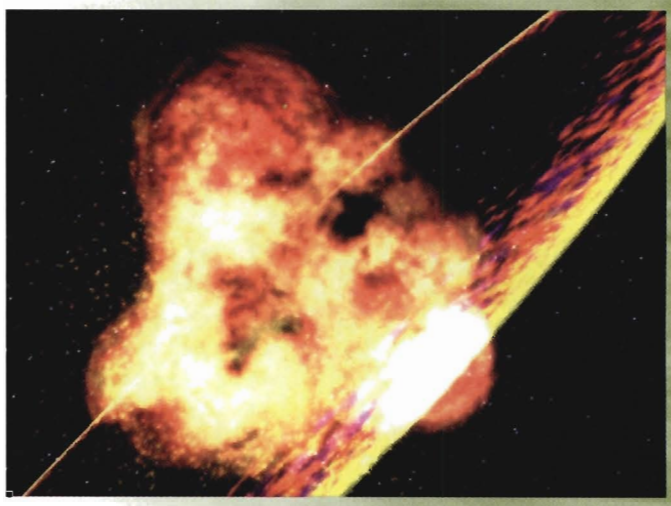

Figure 12b. The final explosion from figure 12a.

Tutorial

A STEP-BY-STEP GUIDE TO CREATING MORE PROFESSIONAL PRODUCTIONS

BY BOBBY WARE

Tools of the Trade Series
Displacement Map Images

LightWave 3D and Inspire 3D offer many different ways to deform objects in an animation. This allows you to pick and choose what works best for you. A couple of months ago I was working on an animation of a squid swimming through a coral reef. The squid's wings needed to flow with the water in a natural way. My first attempt was with several IK chains with strings of bones. With the way I set it up, the movement was unnatural looking. Instead of setting up an entirely new bone structure I decided to try something different.

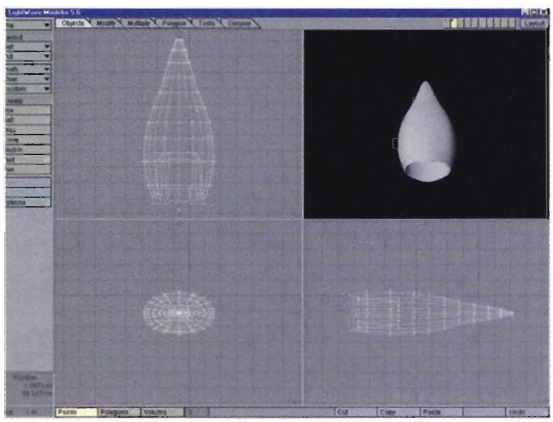

Figure 1

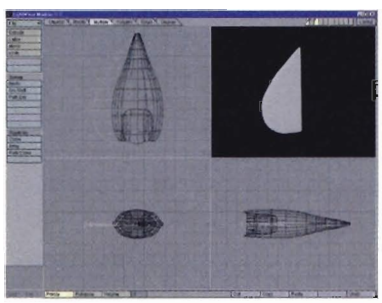

Figure 2

1. For starters, we need to build the squid object. You can make the body wings and head as one object or as four separate objects. For this tutorial I made them into four separate objects because I found them easier to work with.

2. First launch Modeler. We're going to start with the middle section. In the top view make a box approximately 11.5 meters in length with 10 segments in the X axis, one segment in the Y axis, and 10 segments in the Z axis. In the left view drag the box down three meters for the width. Now hit "enter" to make it an object.

3. A squid's body sort of resembles a raindrop or a stretched balloon, so let's start with that shape. Looking in the "top view" leave the lower section of the box alone. The middle of the box needs to be stretched out slightly fatter than the lower section to create the stomach area. Toward the top section of the box (or the tail end of the squid) you will need to stretch the following segments inward in a tapered form, making them almost come to a point at the very top. Your box should resemble Figure. 1.

4. Now on the larger end of the box you need to smooth shift with a value of 0 meters and

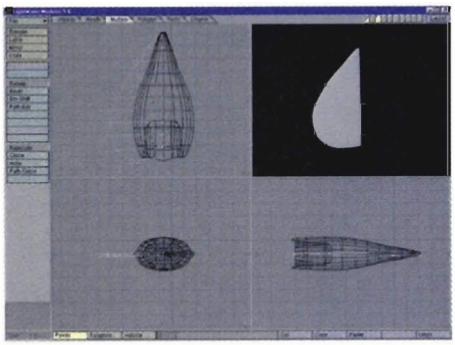

Figure 3

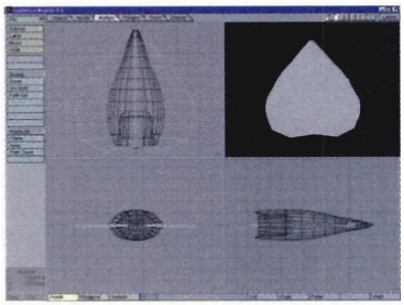

Figure 4

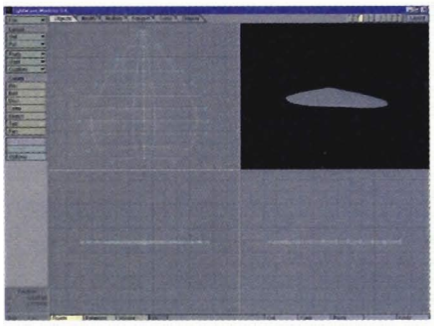

Figure 5

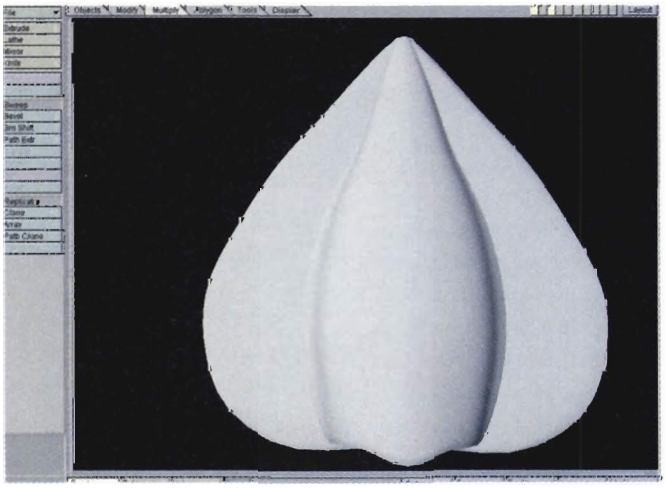

Figure 6

scale inward "in the face view" about 0.5 meters. Then hit smooth shift again with a value of 0 meters and drag this polygon up inside the box to hollow the body out. Hit tab to see a NURBed version of this and save it out as "squid body" (see Figure 2).

5. For the wings I started by making a box in the top view about 11 meters in length with 10 segments, making one side aligned with the middle of the body from the front of the body to the tail end. I went ahead and smooth shifted the inside polygons running along where the spine would be and pulled them out just a little bit to give that side of the box a straight edge.

6. The outside of the box needs to follow the outside of the "squid body" from front to back, sticking out about 2 meters at the front of the body and 0.2 meters at the tail end of the body. To do this you will have to select the outside points individually and move them outward from the body but at the same time following its contour (see Figure 3).

7. For the thickness of this box make it about 0.4 meters in the left view. Now mirror this box going down the middle of the body. Your object should now be looking similar to Figure 4.

8. We want to make the wings very flat on the outer edge. To do this we need to squash the outer edges of the wings by selecting the outer edge points in the top view and pull them in toward each other using the stretch tool. Hit tab to see the NURBed version of this and save them out as "squid wings." Your object should now be looking similar to Figure 5.

9. Give all three objects different surface names and save them over again. I named the body surface squid body, and the wings surface squid wing.

10. Put the wings and the body in the same layer, and in the perspective view move the objects around so you're seeing the top or bottom view of them. Make the perspective view full screen and zoom in until the objects fill the screen (see Figure 6). Now make a print screen of this. You will need to bring this print screen into Photoshop. The purpose of this step is so the size of the displacement maps will fit exactly where you want them to be on the objects.

11. Now launch Photoshop, open a new document and hit (control v) to paste the image of the printscreen. Once you have your image in Photoshop you need to change the foreground color of your paint pallet to black and the background color to white. We don't want to use any color for this step.

12. Create a new layer. From here, using the airbrush tool, you are going to paint the area where you don't want

the wings to move black, which is in the middle(the squid body area). Next, paint the area where you want the wings to move white. Be sure to make the transition with a very soft edge so it will look more natural. One of the most crucial parts is to make sure the black and white areas are going straight up and down vertically (see Figure 7). (Hold the shift key down when you start to paint to make a perfectly straight line). Save this image out as "Rolls alpha."

13. Now, you need to make the waves image. By this I mean make the image that will allow the wings to flow through the water. First, clone the rolls alpha image. Now select your gradient tool and go into edit in your gradient tool options. Change the setting to "Foreground2Background". Create four black gradient strips in your color bar and hit OK (see Figure 8).

14. Now create the gradient going from top to bottom. Make sure the transitions from black to white are very subtle and smooth. Your image should be looking like Figure 9. Save this image out as "Rolls."

15. Toggle back into Modeler (using alt /tab) to finish modeling the head, tentacles and any other objects that you want in the scene. For the head I started out with a box and gave it four segments on the Y-axis and six segments on the x-axis.

16. To make the eyeholes I took two of the side polygons and smooth shifted them into the head to create an indention. I used two spheres to create the eyes that should be placed over the indentions you just created.

17. To make each tentacle I smooth shifted individual polygons from the front of the box one at a time. My squid has 24 tentacles.

18. Don't forget to freeze (cntrl d) all of your objects before you are ready to go into Layout. I like to save a NURBed version and a frozen version for Layout. This allows me to easily exit my object later if a client has a change, or if I need to model another object that is similar.

19. Now open up Layout and load "Squid body" and "Squid wings." Make sure the squid wings object is selected and with that go into the displacement map. For the Texture image load the "Rolls" image and make it a negative image on the Y axis and automatic size it. To make the wings look like they are flowing through the water we need to give it velocity. I used 200mm on the Z-axis because my squid is moving from right to left. I set the amplitude of the displacement to 0.8. You may use whatever you feel is a high enough arc in the wings.

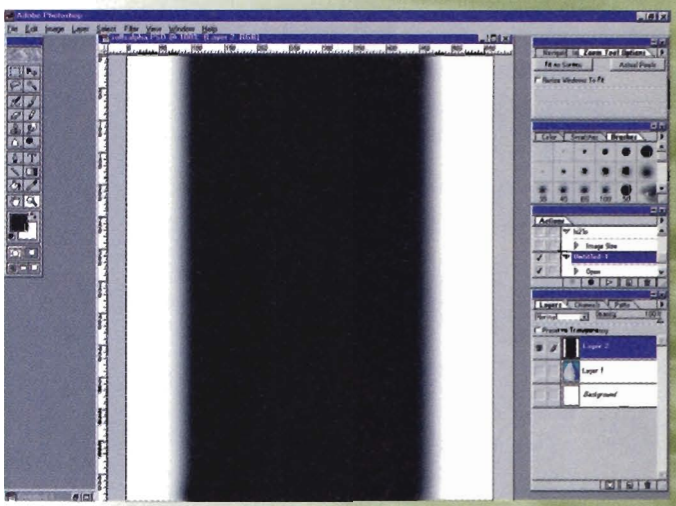

Figure 7

20. Now under your texture alpha image load the "Rolls alpha" image. Your screen should look like Figure 10. Make sure the width and height repeats are on, and you are using the planar image map setting. Save your scene and render out a preview.

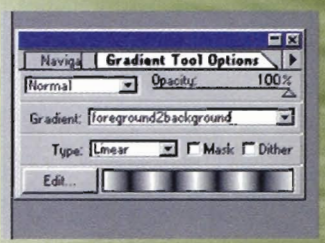

Figure 8

21. Congratulations! You're done! See how the areas of the images that are black don't move and the areas that are white do move. Readjust some settings if necessary, give the objects some textures, and you should be ready to animate. I hope this technique adds another tool to your arsenal. LightWave gives you the ability to work the way you want to work.

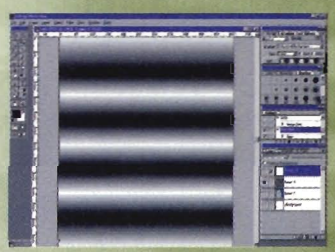

Figure 9

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B&H
PHOTO - VIDEO - PRO AUDIO

QUICK DIAL 74

Panasonic
Broadcast & Television Systems

AG-EZ20
DV Palmcorder with IEEE1394 DV Interface

Innovative and feature packed, AG-EZ20 is easy to use with up to 90 minutes of recording time on a standard battery. It has a surprisingly rugged, durable body that is also compact and comfortable to hold, making it ideal for use in the field for single handed news gathering operations. Features include Photo Shot which is useful for creating video photo albums or insurance tapes. As many as 750 pictures can be recorded on a 60 minute tape. To enhance creativity, the lens can accommodate settings which include focus, gain, white balance, shutter speed and backlighting.

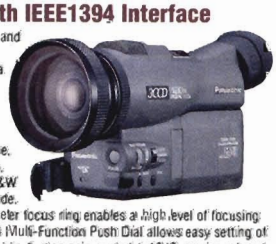
- Equipped with the IEEE1394 DV interface so dubbed recordings will be clones of the original, or download to your computer where they can be edited. (DV capture card and third-party software required).
- Can record in both SP and LP modes for up to 1.5 hours of recording on a 60-minute tape–with no degradation in picture or audio quality. SP mode is provided for compatibility with Panasonic's DVC PRO VCRs.
- Digital Electronic Image Stabilizer prevents jittery video.
- Variable speed 10:1 power zoom lens, plus 100:1 digital zoom. Lens can focus up to 1/4-inch from the subject.
- 180,000 pixel color viewfinder for remarkably clear viewing.
- Time date stamp with seconds for legal and law requirements like depositions & crime scenes.
- Digital effects include audio and video fade, wipe, mix, strobe, solarization and trail. Also has sepia tone for an antique look and negative/positive so film negatives can be converted in-camera to viewable pictures.
- 3.8-inch color LCD monitor (131% more area than a 2.5-inch display) rotates 270° vertically and 180° horizontally, so you can monitor your shoots – no matter the angle.
- Full manual control of focus, gain, white balance, shutter speed and backlighting.

$1099

AG-EZ1 3-CCD Digital Video Camcorder

- Digital recording delivers 500 lines of horizontal resolution with no noise. (S/N ratio is 54dB).
- 10:1 power and 20:1 digital zoom lens. Both zooms are adjustable in four speeds (3.5-15 sec.) For extreme close-ups the lens can focus up to 1/4" from the subject.
- Two digital audio modes, choose between two-channel 16-bit stereo recording or two sets of 12-bit stereo.
- Huge 1.5" 180,000 pixel color viewfinder with 400 lines of resolution displays all functions on demand.
- Digital Electronic Image Stabilizer (DEIS) compensates for jittery video. Particularly effective when the digital zoom is employed.
- Variable speed shutter from 1/60— 1/8000 of a second
- Built-in SMPTE time code generator.
- Digital Photo-Shot lets you record a still-frame for six seconds, while audio continues as normal. 290 still pictures can be recorded on a single 30-minute tape. TopScan function finds any shot easily.

AG-EZ30
World's Smallest 3-CCD Camcorder with IEEE1394 Interface



The AG-EZ30 combines 3-CCDs and the DV format to deliver a level of picture and sound quality that makes it one of the most advanced camcorders of its kind. Weighing just 1.5 lbs., this incredibly lightweight camcorder also incorporates a large 2.5-inch color LCD monitor and has a host of sophisticated auto functions as well full manual control when required.

- 3-CCDs (270,000 pixels each) with a large light-collecting area give the camera high sensitivity and wide dynamic range. Double-density pixel distribution and a gapless dichroic prism further ensure razor-sharp images and extremely faithful color reproduction.
- Selectable 2-channel 48 kHz/16-bit or 4-channel 32 kHz/12-bit PCM audio recording.
- Built-in stereo mic and external mic input as well.
- 180,000 pixel, 2.5-inch color LCD monitor. Also has a 0.5-inch color viewfinder
- Digital Image Stabilizer for clear, shake and jitter free shots.
- 12X optical zoom as well as 30X and 120X digital zoom functions. Move from wide-angle to full zoom in 1.3 seconds allowing quick framing while in REC pause.
- Offers six digital effects: Wipe, Mix, Strobe, Gain-Up, B&W and still mode.
- Large-diameter focus ring enables a high level of focusing precision. A Multi-Function Push Dial allows easy setting of the 16-step iris, 5-step gain control (+12dB maximum) and 14-step shutter (up to 1/8000 second). Mic input level can also be set in steps (-20/-10/0/+3/+6 dB).
- Five program AE modes for shooting in a variety of different conditions. There is also a five-mode white balance: Set, Fluorescent, Auto, Indoor and Outdoor.

Canon

XL-1
3-CCD Camcorder with Interchangeable Lens Mount

With 3-CCDs, exclusive interchangeable XL Lens Mount System, unmatched optical technology, SuperRange Image Stabilizer, DV and simultaneous four channel audio recording, the XL-1 offers unmatched image quality and shooting versatility.

Interchangeable XL Lens Mount System:
- Interchangeable XL lenses for unsurpassed flexibility and superior range. XL lenses incorporate the highest quality, multi-coated optics to achieve 600 lines of resolution.
- In addition to the standard 16:1 lens, there is an optional 3X wide-angle lens, a 1.6X extender and an EF to XL adapter.

16:1 Optical Zoom with SuperRange Image Stabilizer
- The 16:1 has a focal length range of 5.5 to 88mm (35mm equivalent of 39 to 633mm). It offers variable speed zoom, manual zoom and manual focus control and has a one-push auto-focus button and built-in 1.5X ND filter.
- Besides a gyro sensor, the SuperRange Optical Image Stabilizer uses a motion vector to examine the image after it is received by the CCD to detect any shake missed by the gyro. Data is then fed back to refine the movement of the wide-angle prism resulting in the most advanced stabilization system available today.

Digital Audio
- Three digital audio modes (16 bit and two 12 bit modes) and simultaneous recording of four separate tracks. You can output each signal independently.
- Audio inputs with independent level controls.
- Optional MA-100 Mic Adapter/Shoulder Pad allows use of two XLR mics and allows shoulder mounted shooting.

3-CCDs:
- Three 270,000 pixel CCDs with advanced Pixel Shift technology achieves 530 lines of resolution.
- Large 72 micron CCDs deliver a 4dB improvement in sensitivity. Vertical smear is also dramatically reduced.

Three Recording Modes:
- High resolution full motion video (Normal Movie Mode)
- High resolution stop action images of moving subjects (Frame Movie Mode)
- Perfect stills (Digital Photo Mode).

Unique Design & Dual Action Carrying Handle
- In addition to the normal side grip, the handle includes an additional start/stop switch and zoom control for dual-action shooting.

Additional Features:
- 180,000-pixel color viewfinder
- Zebra pattern and color bar generator
- Automatic and manual white balance, gain (five preset levels from -3 to +12dB) and exposure lock.
- Composite, S-Video output, DV (IEEE 1394) in/out, Control L
- Digital fader and wide screen TV effect
- Headphone jack with level adjustment
- Remote control with joy/shuttle dial

QUICK DIAL 74

JVC

GY-X2B 3-CCD S-VHS Camcorder

- Three 1/2" CCDs deliver 750 lines of horizontal resolution and S/N ratio of 62dB
- Exceptional sensitivity of F8.0 at 2000 lux and LOLUX mode lets you shoot superb footage with excellent color balance at a mere 1.5 lux
- Variable Scan allows flicker-free shooting of a computer screen
- Full Time Auto White circuit lets you move from incandescent to fluorescent to outdoor lighting without changing white balance or the filter wheel.
- Quick Record Mode - when turned on the camera is set to the auto iris even if lens is set at manual. Also activates Automatic Level Control and Extended Electronic Iris which provides both variable gain and variable shutter. Shoot continuously from dark room to bright outdoors without having to adjust gain, iris or ND filter.

SONY

DXC-637 3-Chip Color Video Camera

- PVW-637 - Perfect camcorder operation with the PVV-3
- Compact size, lightweight and low power consumption
- High density three 2/3-inch IT Hyper HAD sensors
- 800 TV lines of horizontal resolution
- HAD sensor structure
- 2 dimensional optic low pass filter
- Clear scan function for shooting computer displays • Hyper Gain mode
- EZ mode and EZ Focus functions enable cameramen to get ready for shooting swiftly
- Dual Pixel Readout technology
- Can be coupled directly with the DSR-1/PVV-3 for high quality component acquisition or with the EVV-9000 for handy operation
- Can be combined with the recorders from Panasonic or JVC
- Can be connected with computer equipment via CA-325A/325B camera adapter.

DXC-637 with Fujinon 16:1 zoom lens, tripod plate and hard case **$7495**
also available in Betacam or DV-CAM packages; call for prices.

DSR-200A 3-CCD Digital (DVCAM) Camcorder

Combining a compact and lightweight body with the superior picture quality of DSP (Digital Signal Processing) and the DVCAM format, the DSR-200A is the ideal acquisition tool for video journalists, event and wedding videographers, stringers and production houses. 500 lines of horizontal resolution, 48kHz or 32kHz digital audio, three hour record time, and minimum illumination of 3 lux is only the beginning. Other features include 16:9/4:3 capability, Steady Shot, high resolution 1-inch viewfinder, time code operation, time/date superimposition and an IEEE-1394 interface for direct digital output. Offers full automatic as well as manual control of focus, iris, gain, white balance and shutter speed.

- Variable servo 10X optical power zoom lens goes from 5.9 to 59mm in 1.7 to 24 seconds. The manual zoom rocker is continuously variable right up to where the digital 20X zoom kicks in.
- Sony's Super Steady Shot reduces high frequency camera shake without compromising image quality. SteadyShot uses horizontal and vertical motion sensors that allow it to work accurately while zooming, moving (even shooting from a car), and shooting in low light conditions.
- Has digital effects including audio and video fade, overlap and Slow Shutter.
- Automatic and manual focus, iris, shutter, gain and white balance. Iris is adjustable in 12 levels from F1.6 to F11, shutter from 1/4 to 1/10,000 of a second in 12 steps, Gain from -3dB to +18dB in 8 steps.
- Zebra Pattern indicator, built-in ND filter.
- Custom Preset function lets you preset, store and recall custom settings for color intensity, white balance (bluish or reddish), sharpness and brightness.
- Stores Photo, Date/Time, Shutter Speed, Iris, Gain and F-stop for easy recall. So if you have to re-shoot, you know your original settings for every scene and frame.
- Records Drop/Non-Drop Frame time code. Time code can be read either as RC time code or as SMPTE time code
- Has a large 1-inch B&W viewfinder with 550 lines of resolution for easy focusing even in low contrast lighting situations. Separate information sub panel displays time code, battery time, tape remaining and other camcorder functions without cluttering up the viewfinder.
- Records 16-bit/48kHz audio on one stereo track or 12-bit/32kHz with two pairs of stereo tracks (L1/R 1, L2/R2), so you can add stereo music or narration.
- One-point stereo electret condenser mic for clear stereo separation. Directivity can be selected from 0°, 90° & 120°
- Automatic & manual (20-step) audio level record controls. Monitor audio with headphones or from the LCD panel which has an active VU meter.
- XLR input connectors for mics and audio equipment.

DSR-200A Field Package:
- DSR-200A Camcorder • NPA-1000/B Battery Case Adapter
- 3 NP-F930/B 7.2v 4000 mAH Batteries
- AC-V900/B AC Adapter, Triple Battery Charger
- VCT-U14 Tripod Adapter • LC-2000CP System Case

DSR-20 DVCAM Player/Recorder

The DSR-20 is a very safe DVCAM VCR with a very compact chassis and a variety of convenient functions for recording, playback and simple editing. It features auto repeat playback, power-on recording/playback, multiple machine control interfaces, AC/DC capability and i.LINK (IEEE1394) input and output. And of course, it offers the stunning image and sound quality inherent to the DVCAM format.

DVCAM Quality
- Utilizing the DVCAM format, the DSR-V10 provides the recording/playback quality and reliability required for professional use. It can also play back consumer DV format tapes without any special adapter.
- Provides two selectable audio modes: a two-channel mode with 48 kHz/16-bit recording, and a four-channel mode with 32 kHz/12-bit recording.
- Dual-size cassette mechanism accepts both mini-size (up to 40 minutes) and standard size DVCAM tapes (up to 184 minutes) without an adapter.

Editing Capability
- Equipped with Control L interface, the DSR-20 can perform simple time code-based editing when connected to another DSR-20 or other similarly equipped VCRs/cameras like the DSR-30, DSR-200A or DSR-PD1. When using the RE-120 or ES-3 EditStation System, the DSR-20 can serve as a feeder player.
- Has DV (IEEE1394) input and output. When connected to other DV equipped machines, the DSR-20 offers digital dubbing of video, audio and data, without any deterioration of image and sound quality. In addition, in the "Digital dubbing including TC copy" mode, full information of video, audio and time code of the original tape can be copied to another tape. Especially useful when making working copies of the original.

Record/Playback Functions
- Automatic repeat function for repeated playback. After reaching either the end of the tape, the first blank portion or the first index point, the DSR-20 automatically rewinds the tape then starts playing back the segment again.
- Power-on recording/playback capability for unattended automatic VCR operation. When connected to an external timer and the VCR's TIMER switch is set to REC, the DSR-20 starts recording as soon as power is turned on. Likewise, when the TIMER is set to REPEAT, the VCR goes into Auto Repeat mode and starts playing back the moment power is turned on.
- In addition to Control L, the DSR-20 also incorporates a Control S and RS-232 interface for remote control operation. Basic VCR functions can be controlled from a PC via RS-232, while Control S allows control via the optional DSR-M10 Remote Control. In addition, with the Control S input/output connector, two or more (up to 50) DSR-20's can be daisy-chained and controlled from one DSRM-10 Remote Control.
- External synchronization enables synchronized playback with other VCRs. Especially important in A/B roll configurations.

Conveniences
- The DSR-20 be powered by AC or DC. Ideal for mobile applications, the DSR-20 can be connected to a 12V power supply like a car battery or battery belt & powered via the 4-pin XLR DC input.
- Can perform searches for Index Points. Which are recorded on the tape as "in-point" marks everytime a recording starts. The DSR-20 can also search for photo data recorded on a DVCAM cassette by the DSR-PD100/200/300, or where the recording date has been changed.
- Supplied with the RMT-DS20 Wireless Remote for control of basic VCR functions. And again, when two or more VCRs are connected via Control S, they can be simultaneously controlled from one wireless remote by simply sending one command to the master deck.

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QUICK DIAL 72

SONY

UVW-1400A Betacam SP Recorder

The UVW-1400A is a non-editing VCR which deliver Betacam SP quality and offer features for a wide range of playback and recording applications. RGB and RS-232 interface make it especially ideal for large screen, high quality video presentation, scientific research and digital video environments.

- Ideally suited for work in computer environments, because RGB signals can be converted into component signals and vice versa with minimum picture degradation.
- 25-pin serial interface allows external computer control of all VCR functions based on time code information. Baud rate can be selected from between 1200 to 38,400 bps.
- Built-in Time Base Stabilizer locks sync and subcarrier to an external reference signal as well as provides stable pictures.
- Built-in LTC Time Code and UB (User Bits) reader/generator
- Equipped with two longitudinal audio channels.
- Auto repeat of entire or a specific portion of the tape.
- Built-in character generator can display VTR status, time code, self-diagnostic messages, set-up menu, etc.
- Control of jog, shuttle, playback, record, pause, FF and REW with the optional SVRM-100A Remote Control Unit.
- Composite and S-Video as well as component via BNCs which are switchable to RGB output. The UVW-1400A has two switchable sync connectors and a Sync on Green.
- Built-in diagnostic function and hour meter.
- Initial set-up menu for presetting operational parameters.

UVW-1700G
Betacam SP Computer Graphics Frame Recorder

The UVW-1700G has all the features of the UVW-1400A (except foot switch control) plus it adds frame accurate video insert editing capability as well as RS-232 and RS-422 interfaces. These make the UVW-1700G ideal not only for conventional video program production but also for animation and computer graphics creation.

Same features as the UVW-1400A *PLUS*—
Uniquely equipped with both RS-232 and RS-422 serial ports for versatile system integration. Both serial ports are easily accessed via the set-up menu. Built-in time code capability combined with sophisticated servo servo system ensures frame accurate insert editing (video only) when connected to computer-based editing systems (via RS-232 port) or RS-422 equipped edit controllers. Ideal VCR for animation and computer graphics creation, where frame-by-frame editing is indispensable.

UVW-1800 Betacam SP Editing Recorder

All the features of the 1400A *PLUS*—

- Optional UVR-60 allows remote TBC adjustment.
- RS-422 interface for editing system expansion.
- Two types of component output: via three BNC connectors or a Betacam 12-pin dub connector.
- Frame accurate editing is assured, thanks to sophisticated servo control and built-in time code operation. In the insert mode of the UVW-1800, video, audio Ch-1/2 and time code can be inserted independently or in any combination.

PVM-14M2U/14M4U & 20M2U/20M4U
13-inch and 19-inch Production Monitors

Sony's best production monitors ever, the PVM-M Series provide stunning picture quality, ease of use and a range of optional functions. They are identical except that the "M4" models incorporate Sony's state-of-the-art HR Trinitron CRT display technology and have SMPTE C phosphours instead of P22.

- HR Trinitron CRT enables the PVM-14M4U and 20M4U to display an incredible 800 lines of horizontal resolution. The PVM-14M2U and 20M2U offer 600 lines of resolution. M4 models also use SMPTE C phosphours for the most critical evaluation of any color subject.
- Dark tint for a higher contrast ratio (black to white) and crisper, sharper looking edges.
- Each has two composite, S-Video and component input (R-Y/B-Y, analog RGB).For more accurate color reproduction, the component level can be adjusted according to the input system. Optional BKM-101C (video) and BKM-102 (audio) for SMPTE 259M serial digital input.
- Beam Current Feedback Circuit
- 4:3/16:9 switchable aspect ratio.
- True multi-system monitors they handle four color system signals: NTSC, NTSC 4.43, PAL, and SECAM.
- External sync input and outputcan be set so that it will automatically switch according to the input selected.
- Switchable color temp: 6500K (broadcast), 9300K (pleasing picture), User preset (3200K to 10000K).
- Blue gun, underscan and H/V delay capability
- On-screen menus for monitor adjustment/operation.
- Parallel remote control and Tally via 20-pin connector.

QUICK DIAL 731

CTI DISK ARRAYS
for Mac and Windows NT

Using PCI Ultra SCSI accelerator cards and Seagate Ultra SCSI 16-bit hard drives, CTI disk arrays provide high data of up to 80 MB/sec to ensure smooth clean video without dropped frames. Especially designed for audio and video applications, Seagate disk drives employ embedded servo technology, eliminating the need for thermal recalibration. CTI disk arrays are fully tested for Windows NT and Power Macintosh systems and are available in fixed and removable configurations. With arrays from 9GB to 72GB and up to 180GB when daisy chained, CTI delivers the flexibility, performance and reliability at a price you can afford.

• Plug and Play • Hot swappable canister (on removable only) • Multiple large power supplies • Efficient cooling and airflow
• RAID striping software for Windows NT or Macintosh • 68-pin active terminators and 68-pin system cables
• Push button SCSI ID selector • All arrays come with a **Five Year Limited Warranty**

2 Bay Tower Fixed

CTI-8FS 8.4GB Array with 2 Seagate Barracuda 4.2GB Ultra Wide drives (#ST34572W) and Single Channel SCSI card (18.2 MB/s sustained transfer rate) **999.00**

CTI-18FS 18.2GB Array with 2 Seagate Barracuda 9.1GB Ultra Wide drives (#ST39173W) and Single Channel SCSI card (28.2 MB/s sustained transfer rate) **1649.00**

CTI-36F2S 36.4GB Array with 2 Seagate Barracuda 18.2GB Ultra Wide drives (#ST118273W) and 2 Single Channel SCSI cards (28.2 MB/s sustained transfer rate)... **2549.00**

2 Bay Tower Removable

CTI-18RS 18.2GB Array with 2 Seagate Barracuda 9.1GB Ultra Wide drives (#ST39173W) and Single Channel SCSI card (28.2 MB/s sustained transfer rate) . . . **2079.00**

CTI-18RD Same as above with Dual Channel SCSI card (39.9 MB/s sustained transfer rate) **2649.00**

CTI-36R2S 36.4GB Array with 2 Seagate Barracuda 18.2GB Ultra Wide drives (#ST118273W) and 2 Single Channel SCSI cards (28.2 MB/s sustained transfer rate)..... **2999.00**

CTI-36RD Same as above with Dual Channel SCSI card (39.9 MB/s sustained transfer rate)..... **3519.00**

4 Bay Tower Removable

CTI-36RS 36.4GB Array with 4 Seagate Barracuda 9.1GB Ultra Wide drives (#ST39173W) and Single Channel SCSI card (28.2 MB/s sustained transfer rate) **3829.00**

CTI-36RD Same as above with Dual Channel SCSI card (39.9 MB/s sustained transfer rate) **4423.00**

CTI-36R2S Same as above with 2 Single Channel SCSI card (46.4 MB/s sustained transfer rate) **4199.00**

4 Bay Tower Removable

CTI-72RS 72.8 GB Array with 4 Seagate Barracuda 18.2 GB Ultra Wide drives (#ST118273W) and Single Channel SCSI card (28.2 MB/s sustained transfer rate) **5623.00**

CTI-72RD Same as above with Dual Channel SCSI card (39.9 MB/s sustained transfer rate) **6159.00**

CTI-72R2S Same as above with 2 Single Channel SCSI card (46.4 MB/s sustained transfer rate) **5999.00**

QUICK DIAL 732

NEWTEK

LIGHTWAVE 3D 5.5
3D Rendering and Animation Software for Broadcast Graphics

LightWave 3D is the easy way to create the most sophisticated 3D animation imaginable. It's intuitive, complete, easy-to-use layout and modeling system deliver the ultimate in creative control, not to mention flexibility. Unparalleled features for modeling, surfacing, lighting and animating are right at your fingertips. Raytracing, motion blur, MetaMation, inverse kinematics (IK), Bones, field rendering, lens flares, compositing - they're all here. And with OpenGL and Quickdraw 3D support you can see your creations in real time. Add a robust plug-in architecture, and it's no wonder you find LightWave 3D in more Hollywood animation suites than any other 3D program. LightWave 3D is available for almost platforms: Windows 95, Windows NT, Power Mac, DEC Alpha, SGI and Sun Microsystems.

LightWave 3D 5.5		Upgrades from LW 5.0 to 5.5		Upgrades from LW 4.0 to 5.5	
For PC (Intel)	**1599.00**	From Intel 5.0	**449.00**	From Intel 4.0	**599.00**
For PC (DEC Alpha)	**1599.00**	From DEC Alpha 5.0	**449.00**	From DEC Alpha 4 0	**599.00**
For Macintosh	**1699.00**	From Macintosh 5.0	**549.00**		
For SGI	**2499.00**	From SGI 5.0	**899.00**		

INSPIRE 3D
3D Art and Animation Software for Graphic Artists, Multimedia Developers and Web Designers (For Mac or PC)

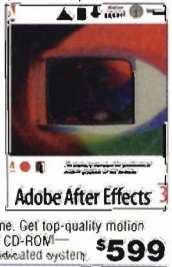
Specifically designed to meet the demand of the graphics pro, Inspire 3D is a powerful program that lets you add a whole new dimension to your work by creating stunning print images, dynamic multimedia productions and slick web visuals that just aren't possible in 2D. With Inspire 3D, you can model, animate and render 3D elements in any style and complexity. By adding texture, motion, lighting effects and more, your print materials will almost pop off the page. Use the images you create as single frame print graphics or as lower resolution animation files for multimedia or the web or choose from a library of pre-created images. And use the photorealistic or stylized animation images you create for real-time graphics applications, including VRML 2.0, for all kinds of projects

- Compatible with Photoshop, QuarkXPress, Illustrator, Freehand, Director, and more. Create simple or complex animations, transform Illustrator files into animated 3D graphics, create killer photorealistic 3D or cartoon-style images and use pre-created or custom modeling.
- Supports 16 image and seven 3D model formats, gives you your choice of output with resolutions up to 8,000 x 8,000.
- Expandable modeling capabilities and a ton of plug-ins for specialized functions. Features like Spline-based modeling and MetaNURBs let you mold and manipulate objects in ways you never could before, then output them as hi-res images - fast. Use Inspire's library of designer images, create your own - or mix the two for interactive content, games, training materials and movies.
- Quickly and easily create brilliant single and composite images and animations to design exciting web sites.
- Uses LightWave 3D's formidable rendering engine to put true photorealistic capabilities right on your desktop. Gives your 3D images the edge you're looking for.
- Revolutionary modeler lets you create any shape or form you dream up just by clicking on a few points. Then reshape, subdivide, clone, modify, repositionand control any object in 24-bit color and view it in real-time.
- Compositing capabilities let you to build sophisticated, layered images for print or animation and combine 3D elements with 2D images or multimedia. You can also use photographs or video with 3D elements and apply front projection mapping to make the elements accurately cast shadows against the photo or video image.
- Intuitive interface with on-screen tutorial get you up and running fast. Want the easiest way to composite? Need a tip on shadowing? Curious about surfacing options? The on-screen tutorial is an encyclopedia reference, teacher and consultant that not only gets you up and running quickly, but helps you be more productive every time you work.
- Includes a complete library of over 1,600 models, objects and other items for you to use alone or in combination with other graphic elements.

Inspire 3D for Windows **385.00**
Inspire 3D for Macintosh **385.00**

Adobe AFTER EFFECTS 3.1
Compositing, Motion Graphics & Special Effects for Mac or Windows

After Effects 3.1 provides the power and features required by film makers, video producers, editors, graphic designers, multimedia professionals and web developers to produce unlimited composites, fluid animations and sophisticated special effects. Available for Mac and Windows, After Effects is tightly integrated with the Adobe product family, so if you work with Premier, Photoshop, or Illustrator, you already have the skills, shortcut know-how, and hardware to make After Effects a seamless, powerful extension of your creative arsenal. Turn your computer into a motion-graphics studio and put awe-inspiring action into your work.



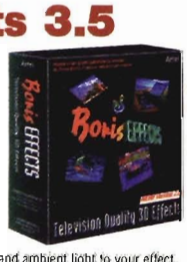
SOPHISTICATED COMPOSITING:
- Combine digitized materials from any source to create sophisticated composites and traveling mattes using transparency, complex masks and alpha channels. Animate Photoshop layers and Adobe Illustrator art with direct import capabilities.

MOTION GRAPHICS:
- Position and animate layers with unlimited keyframes and sub-pixel accuracy. View and edit your spline-based motion paths on-screen. Ensure super smooth motion at any speed with field-rendering and true motion blur.

SPECIAL EFFECTS:
- Use use plug-in effects ranging from precise color correction filters to wipes and blurs, and even Photoshop filters. You can also animate each effect independently over time.

AFFORDABLE QUALITY:
- Create anything you can imagine. Get top-quality motion graphics for film, broadcast or CD-ROM— at a fraction of the cost of a dedicated system. **$599**

Artel Boris Effects 3.5



A multi-channel DVE generator, complete with intraframe interpolation matte manipulation, and multiple keyframes, Boris Effects lets you to create your own custom moves. Boris ships with a keyframe library of over 150 customizable effects including cubes, picture-in-picture, chroma keying, tilting,soft edges, masks, filters and compositing of unlimited track of video and graphics. Effects can be saved or used with different video source clips. Create 3D flying logo effects from PICT, TIFF, bitmap, VIW and QuickTime files using an embedded alpha channel. Other features include borders and drop shadows which can be colorized and made soft and translucent, as well as control over camera position and light source with specular highlights. Based on a plug-in architecture, Boris closely integrates into all of today's popular non-linear systems. Once installed, it is easily accessed from their transitions and filters menus: it is not a background application and no extra memory is required

- Blur and bevel filters.
- Control of image scale (size), positioning, depth and opacity.
- 3D effects with depth control to create cubes or slabs with up to 6 different videos, picts or colors on each of the 6 faces.
- Variable pivot points for unique rotation control.
- Add keyframeable specular and ambient light to your effect.
- Cropping with full softness control of the edges and blend for really smooth soft wipe type of effects.
- Includes a free year of upgrades and full tech support!

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DC-30 *plus*

PCI Capture Card for Windows 95/NT

The DC30 *plus* lets you capture, edit, add special effects or titles to your video, mix CD-quality audio, and then output the final cut to video tape. The DC-30 *plus* also offers fast plug and play installation and easy to use software so you'll be producing studio quality video in minutes. It even analyzes your system and automatically configures itself to provide the optimum video quality.

- The DC-30 is a PCI Bus mastering card that delivers a 6MB per second sustained video data transfer rate for high quality video capture. PCI Bus mastering ensures CPU bottlenecks don't impede the performance of the PCI bus, thereby limiting the reachable video transfer data rate.
- 2.4:1 compression ratio (adj. up to 32:1). A lower compression ratio means a better final video image quality. Compression ratios under 4:1 are considered to be "broadcast quality."
- Real-time video overlay displays the video in real-time on the computer monitor during capture and video editing process eliminating the need for an external video monitor.
- Full NTSC, PAL, SECAM, PAL M for worldwide compatibility.
- Audio and video capture is synchronized to achieve perfect lip-sync. (Capture from 8-bit mono 11kHz to 16-bit stereo 44.1kHz.
- Hardware acceleration of Adobe Premiere provides almost instant display of video "thumbnails" in the construction window (under one second). Acceleration also reduces the time to create "previews" and final video clip with "make movie".
- Includes Adobe Premiere 4.2 full version, Photoshop LE, Adobe Acrobat Reader and Asymetrix 3D /FX animation software. Also includes TitleDeko software, easily adds amazing titles to all of your video productions. Titles can fade up, scroll and even blend with pictures.

DC-30 *plus* for Windows **749.00**
NEW! DC-50 Same as DC-30 plus with component in/out **1649.00**

Miro DC-30 *plus* Turnkey System:

- 220-watt midtower case • Pentium 233 MHz MMX processor • PCI motherboard with 512K cache
- Diamond Stealth 3D 3000 4MB DRAM PCI display card • 64MB of RAM • Quantum 3.2 GB IDE system drive
- Seagate (Barracuda) 9GB SCSI-2 FAST/Ultra-wide hard drive • Adaptec AHA-2940UW FAST/Wide SCSI-2 controller
- 3.5" floppy drive • Teac CD-532E 32X EIDE internal CD-ROM drive • Altec-Lansing ACS-43 2-piece speaker system
- Focus 2001A keyboard • Microsoft MS mouse • Viewsonic G771 17-inch 1280 X 1024 SVGA monitor
- Windows 95 • Miro DC-30*plus* video/audio capture card • Adobe Premiere 4.2 (full version) editing software, Adobe Photoshop 3.05 LE imaging software and Assymetrix 3-D F/X animation & TitleDeko software **$2995.00**

DV-300

IEEE 1394 Digital Video Capture Card

A digital video capture, editing, and playback solution for Windows 95/NT and MacOS , the DV-300 is built around an intuitive software application that offers frame-accurate DV camera control, uncompromised image quality, and the ability to intelligently search digital videotapes for individual scenes. Additionally, the DV300 differentiates itself by providing a built-in SCSI port for connection to high speed drives.

DV-300 Hardware:

- PCI board with bus mastering interface
- Includes 1394 cable
- One internal and two external DV connections
- Bundled with Adobe Premiere 4.2 LE
- Convert your DV data for editing with other miroVIDEO editing adapters (e.g. miroMOTION DC30, DC30 plus.)

DV-300 DVTools Software:

DVTools automatically scans the DV tape and finds scene in and out points. The Camera Controller allows for previewing before down loading any data. Scene locations with timecode are organized in the drag-and-drop Capture Gallery. Scenes can be trimmed so only the video you want is captured, saving you valuable hard drive space.
Once you have arranged the scenes to edit, DVTools will automatically cue the camera and capture them.

Segments can be arranged for a cuts only production, or loaded into Premiere for effects and transitions. miroINSTANT DV, a plug-in for Premiere renders only effects and transitions, saving up to 50% of your hard drive space by not re-rendering the video clips. The video and the effect segments are then stored as individual video files. When production is finished, output to the camera through the IEEE1394 link. From Premiere, miroINSTANT DV automatically prints files back to tape in one pass, overcoming the 2 GB movie size limitation.

PINNACLE SYSTEMS GENIEPLUS

Post-Production System on a Single PCI Card

Based on Pinnacle's EMMY award-winning special effects technology, GeniePlus is a complete desktop post-production system that includes a 3-D DVE/switcher, advanced character generator, fast still-store and a dynamic paint system – at a price you can afford. Equipped with an incredible array of features on a single PCI card, GeniePlus lets you create your own stunning effects, including page turns, water ripples and spheres with uncompromised 4:2:2 digital quality. The full-function 3-D DVE provides ultra-smooth motion and no breakup (pixelation) when pictures are sized or rotated. You'll be able to create exciting warp effects with lighting, trails, shadows and borders faster and easier than ever before.

Switcher/DVE:
- Two live inputs, two frame buffers for use as still-stores, and built-in matte and black generators. Internal linear keying allows multiple layers to be created in a single pass.
- Over 100 effects and transitions including single-pass page turns, warps, ripples, spheres, trails, shadows and a wide variety of borders. You also have control over lighting and virtually all the controls can be keyframed.
- Full spectrum chroma keying with amazing quality. Quickly choose the exact color you want to key out.
- Add warp shapes including hourglass, hexagon, balloon, diamond, octagon and bumps to the foreground image
- Need a glint to float across the screen or title? How about a spot light to enhance the scene? Maybe you need to darken all but a certain part of the screen to point out an element? They are all yours with Manual Highlights controls.

Paint:
- Cursor is invisible. As a result, brush strokes look like animations, and may be used to illustrate sports moves, show an itinerary over a map or illustrate weather reports
- Any Windows font can be used for Paint, and text may be scaled, rotated, etc. Shadows and outlines are easily applied and there are many options for the color of the text.

Character Generator:
- GeniePlus comes bundled with Inscriber CG, the standard for character generation. Supports multiple fonts (TrueType or PostScript), a great variety of text styles, geometric objects, backgrounds, and different color combinations.
- Styles include a combination of settings such as emboss, glow, shadow, outline, gradient, and transparency.
- Import regular ASCII text files. Adjust text to the screen with automatic horizontal and vertical centering tools. Lines can be automatically abutted, aligned to the right or left, or placed anywhere on screen. Logos can be imported and placed at will. Backgrounds can be comprised of graphics files, solid colors, gradients or live video.
- Variable speed rolls and crawls.CG pages can be used directly from Inscriber or saved to be used by the DVE.

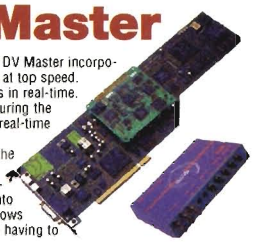
Other Features:
- Has connections for six video inputs—three composite and three S-Video —two of which may be switched at a time. (Accepts NTSC or PAL signals). S-Video and composite sources can be mixed. There is also an external sync input with loopthrough.

TURNKEY GENIEPLUS COMPUTER SYSTEM

- 220-watt midtower case • Pentium 233 MHz MMX processor • PCI motherboard with 512K cache
- Diamond Stealth 3D 3000 4MB DRAM PCI display card • 64MB of RAM • Quantum 6.4 GB IDE system drive
- 3.5" floppy drive • Teac CD-532E 32X EIDE internal CD-ROM drive • Altec-Lansing ACS-43 2-piece speaker system
- Focus 2001A keyboard • Microsoft MS mouse • Viewsonic G771 17-inch 1280 X 1024 SVGA monitor
- Windows 95 ***plus*— card and software installed** **$6495.00**

QUICK DIAL 731

FAST DV Master



Unlike software-based DV systems that can be as slow as six times real-time, DV Master incorporates Sony's DVBK-1 DV hardware CoDec to guarantee lossless transmission at top speed. With just one cable you can transfer video, sound and machine control signals in real-time. Also allows the display of live video during "capture", as well as at any time during the editing process. You can scrub in or trim the timeline, and then preview it in real-time at full-screen, full-motion on your video or computer monitor.
Another advantage of having the Sony DVBK-1 on the board, is that it allows the DV Master to act as a real-time video transcoder. Using the supplied breakout box, you can simultaneously convert analog composite, S-Video and component into digital and vice versa. This is ideal for archiving analog footage onto digital as well as for mixing analog and digital footage when editing. It also allows you to transfer edited digital footage directly to S-VHS or Betacam SP without having to first go back to the camera.

DV Master w/Ulead Studio Pro 5.0 ..... **1899.00**
DV Master w/InSync Speed Razor DV Software **2799.00**

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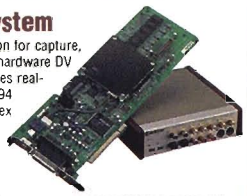
DVRex-M1

The Complete DV Digital Video Editing System



The DVRex-M1 is a hardware and software bundle that offers a complete solution for capture, output and editing of DV (Digital Video) signals. Equipped with Sony's DVBK-1 hardware DV codec, a breakout box and ULead's Media Studio Pro 5.0, the DVRex-M1 provides real-time capture and output of DV signals from your camera or VCR via the IEEE1394 port, or converts any analog video and audio to DV. The system also includes Rex Edit software so you can control your DV camera or deck, batch capture video and audio, add new audio tracks and scrub in real-time. DV editing has never been so fast, easy and flexible!

Hardware Features:

- High quality, scalable video windows displays real-time, full-screen video during capture, editing and output.
- During analog capture and output, video characteristics like brightness, contrast, saturation etc. can be manually set.
- When incorporating effects, an optimized hardwared DV codec cuts rendering time up to 25%.
- Unique DV breakout box can be used either externally or internal in a 5-1/4" drive bay. The box features composite and S-Video input/output, DV input/output and analog stereo input/output. With the optional M2 module it can also output component video signals and input/output digital audio signals (RCA and optical).

Rex Edit Software Features

Manual and Batch Capture:
- Capture up to 20 minutes (4GB) into one AVI file
- Seamlessly capture long DV segments in one pass (over 20 minutes)
- Capture audio from single of multiple DV channels if desired
- Frame accurate camera control when defining a batch list of video clips
- When batch capturing, camera automatically seeks to clips
- Batch clips can be stored in one or multiple AVI files

Editing:
- Easy to use drag-and-drop interface with audio and video timeline. Manually scrub through the timeline using a Microsoft IntelliMouse
- Real-time video insert and audio scrubbing
- Video can be output directly from the timeline with seamless playback
- Works together with ULead's MediaStudio Pro 5.0 (bundled with DVRex-M1) for effects and titling

Multi-Channel Audio Input and Output with Mixing:
- Capture and output native DV multi-channel audio
- Audio is pertectly synced with video during production and output
- Overcomes AVI single channel limitations with real-time audio mixing
- Multi-channel audio requires no rendering for real-time adjustment and output

Available with or without Ulead software

TRUEVISION/Avid

TARGA 1000/MCXpress

Professional Video Production Workstation

Incorporating the award-winning TARGA 1000 video card and Avid MCXpress NT non-linear editing software, this fully-configured workstation meets the needs of production professionals, corporate communicators, educators and Internet authors.

TARGA 1000 Features:

The TARGA 1000 delivers high processing speed for video and audio effects, titling and compositing. Capture, edit and playback full-motion, full-resolution 60 fields per second digital video with fully synchronized CD-quality audio.

- Compression can be adjusted on the fly to optimize for image quality and/or minimum storage space. Has composite and S-video inputs/outputs. Also available with component input/output (TARGA 1000 PRO).
- Genlock using separate sync input for working in professional video suites
- Audio is digitized at 44.1KHz or 48KHz sampling rates, for professional quality stereo sound. Delivers perfectly synchronized audio and video.

MCXpress Features:

The ideal tool for video and multimedia producers who require predictable project throughput and high-quality results when creating video and digital media for training, promotional/marketing material, local television and cable commercials, CD-ROM and Internet/intranet distribution. Based on Avid's industry-leading technology, it combines a robust editing functionality with a streamlined interface. Offers integration with third-party Windows applications, professional editing features, powertul media management, title tool and a plug-in effects architecture. It also features multiple output options including so you save time and money by reusing media assets across a range of video and multimedia projects.

TARGA 1000/MCXpress Turnkey Systems:

- 300-watt, 6-Bay Full Tower ATX Chassis
- Pentium ATX Motherboard with 512K Cache
- Pentium II- 300 MHz Processor
- Matrox Millenium II AGP 4MB WRAM Display Card
- 64MB 10ns 168-Pin (DIMM) S-DRAM
- Quantum Fireball 6.4GB IDE System Drive
- Seagate Barracuda External 9.1GB SCSI-3 Ultra Wide Capture Drive
- Adaptec AHA-2940UW Ultra Wide SCSI-3 Controller Card
- Teac CD-532e 32X EIDE Internal CD-ROM Drive • 3.5" Foppy Drive
- Altec-Lansing ACS-48 3-Piece Deluxe Speaker System
- Viewsonic G771 17-inch (1280 x 1024) Monitor (0.27mm dot pitch)
- Focus 2001A Keyboard • Microsoft MS Mouse
- Windows NT 4.0 Operating System Software
- Avid MCXpress for Windows NT
- Truevision TARGA 1000 or 1000 Pro Video Capture Card

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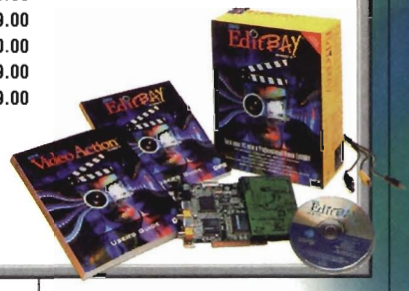

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Motion Gang – A motion plug-in for LightWave, created by **Hitachi**. This plug-in allows you to create human characters with just a simple operation of specifying only the parameters. It is most appropriate for users who do not want to spend extra time creating human models and movement, or, for people who want to create prototype images quickly. It is supported by Windows NT 4.0/Windows 95 ..... **239.00**

Motion Designer – A deformation plug-in that allow animations to be created using physical stimulations. **Motion Designer** is highly effective in creating animations of soft objects, such as cloth **359.99**

Polygon Eater – A reduction plug-in for LightWave. It quickly reduces the number of polygons to the number desired, while maintaining the characteristics and overall shapes of models. Also, enables you to control reduction for each part as well as for the whole model **159.99**

PGL – PGL is the plug-in that applies the bone deformation, different from that of LightWave 3D. It allows you to create animations that use more advanced bones with applying deformation, completely depending on certain bones without the effect of surrounding bones **189.00**

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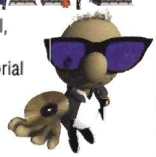

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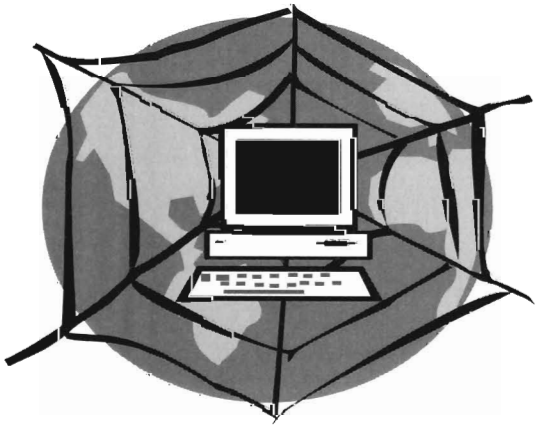

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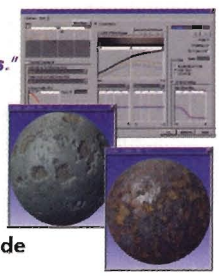

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Don't Waste My Time

A candid interview with LightWave 3D

Mojo interviews LightWave 3D with some interesting results...

BY MOJO

MOJO: LightWave, thanks for taking the time to talk with me. We're all very big fans of yours at Foundation Imaging.

LightWave: No prob, Mojo. It's high time somebody spoke directly to me, instead of that Hastings guy who keeps getting all the press. Doesn't anyone care what *I* think?!

MOJO: Absolutely we do. That's why I'm here!

LW: OK, good.

MOJO: Let me start out by asking what project you're most proud of.

LW: Oh, that's easy. I hate to jump on the bandwagon, but I gotta say *Titanic.* I know, I know, everyone and their brother keeps going on and on about that damn movie, but what can I say? It even made my mom proud!

MOJO: What about it impressed you so much?

LW: It was different! The application took people by surprise. I mean, can I be honest with you? I've had it up to here with spaceships and freakin' car commercials. Sure, I know that's the bread and butter for a lotta folks but come *on* people—do something different with me! Stop thinkin' so small.

MOJO: What do you mean by small?

LW: Everyone's so busy using me for special effects and cartoons that they're not seeing the big picture. I can do that stuff in my sleep! There's so much more potential in here [points to chest]. I feel like a Swiss Army Knife that some bozo only uses for the toothpick.

MOJO: Well, there are a lot of companies that are working on all CGI movies using LightWave. Is that the kind of thing you're talking about?

LW: Sorta. But even the projects I've heard about are putting me to sleep. What's this thing I hear about that you guys at Foundation are working on? Vertex?

MOJO: You mean *Vortex*?

LW: Yeah, that's it. I saw the trailer. It was cool. A lot of it looked real.

MOJO: Thanks.

LW: But what's the point?

MOJO: What do you mean, 'the point?'

LW: From what I can tell, it looks like *Vortex* is just another hundred million-dollar Hollywood action movie.

MOJO: Yeah, but using you we can make it at a fraction of the cost!

LW: But why bother making it all? It's been done. So what if it's all CGI?

MOJO: Ah! But you see, in *Vortex* even the actors will be CGI—no one's ever done that before! It's a first. In fact, everyone's racing to the finish line on this one.

LW: Oh, gimme a break with this whole CGI actors thing. I have yet to see a convincing LightWave actor.

MOJO: Well, it's almost there. With a little more time and R&D, I think.

LW: Yeah, with a little more blood and sweat you might just have a CGI actor that looks like a real one—and with only 10 times the amount of work it takes to stick some schlub in front of the camera.

MOJO: I guess you have a point there.

LW: I'm not trying to shoot you down, but I just can't see how an audience is going to give a flying fig if an actor is real or CGI—they just want to see a good movie.

MOJO: Well, CGI people or not, *Vortex* is still going to be a good movie. We've got action scenes that really blow *Independence Day* right out of the water!

LW: That's great. Can you do me a favor?

MOJO: What?

LW: Can you use 3D Studio MAX to make your movie?

MOJO: WHAT?!

LW: You heard me. Don't waste my time using me to make a CGI knockoff of a Hollywood action movie. Or anything else I've already seen, for that matter.

MOJO: But this one is different!

LW: No it's not. You want to see different? Here, look at this. [hands me a collection of cover art from classic science fiction novels] *This* is different! The people who painted these covers were running on pure imagination! They didn't have any concerns about budgets or what can and can't be done in a modern movie—with paint and a paintbrush the sky's the limit! That's how I wish people would think of me—not as a production tool, but as a bucket of paint. With me at your disposal, you can create absolutely anything and all you want to do is make cheap clones of Schwarzenegger and Stallone movies. You should be ashamed.

MOJO: You've certainly provided some food for thought. One more question—what's a flying fig?

LW: They'll know.

Mojo is a senior supervising animator at Foundation Imaging.

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	Glyder GM238	Permedia II Chipset w/8M PCI	$79
	TX-GOLD 316	TX Chipset 8Mx8M PCI	$159
STB Symmetric	VELOCITY 4400	16Mb Twin Texel Processor AGP or PCI , TV Out	$128
	BlackMagic 3D	Voodoo2 3DFX Chipset with 12meg PCI	$128
	VELOCITY 128	nVIDIA Riva 128ZX AGP, TV Out	$89
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E&S	AccelGalaxy	36M E&S Chipset 20Mx16M Dual Screen Ready stereo	$1245
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	AccelGMX 2000	Dual Gamma MX Chipset 16Mx80M, 2M VGA	$1479
	AccelEclipse II 32	Eclipse II Mitsubishi 3DPro/2mp32M AGP/PCI	$1080/$819
	AccelPRO 24MX	MX Chipset with 8Mx16M PCI/Accelstar II 8 AGP/PCI	$748/$135
3Dlabs	DP402	4 Oxygen chip 32M Support MS Window NT PCI	$729
	DP Oxygen RPM	64M 2 Oxygen RPM Chip Dual Screen Ready AGP	$995
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matrox	Millenium	G-200 Comes with 8meg 2X AGP	$119
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	Productiva G-100/DG	G+DUALP Dual Monitor support (2)4mb 64bits PCI	$479/$50TV
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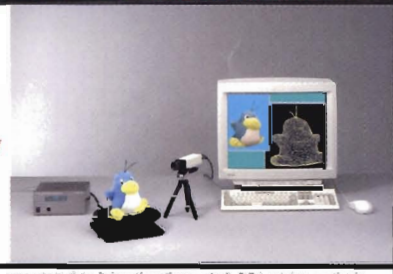

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